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THE TREE DOCTOR

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THE TREE DOCTOR

A

BOOK ON TREE CULTURE

Illustrated Profusely with Photographs.

BY

JOHN DAVEY.

1904

THE SAALFIELD PUBLISHING COMPANY

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by
John Davey

INTRODUCTION.

THE Americans are a people who love the beautiful, and yet, strange to say, they have destroyed the trees, which are among the grandest objects of all nature. This, however, has not been intentionally done. The pioneers made war on trees, slaughtered them, burnt them up and got rid of them the easiest and quickest way they could devise. To a certain extent, this was excusable, as the land was needed for other purposes. Thousands now regret that they did not preserve some of the giants of the native forests. The majestic elm in this photograph is one of them. What would you give to have it in your yard?

Our people now deeply deplore the mistakes that have been made, and are spending millions of dollars annually, in the hope of establishing sufficient shade and fruit trees for the requirements of man and beast. In spite of all their noble efforts they are meeting defeat on every hand. The whole trouble is traceable to two oversights. It was my intention, five years ago, to point out these facts and the accompanying evils in a lecture, by the aid of the stereopticon; but I saw that a thousand persons in that work could not reach the masses in ten years. Then I thought I would write for some papers, but

readily discovered that but comparatively few people could be reached, and such reading is not easily preserved. Finally, I determined to put the *camera* to work. Two "authorities" might disagree on a certain point, and the public say, "They can't both be right; may be both are wrong." When, however, the camera gives you a picture, *that* is something from which you cannot get away. I had first intended to use fifty photographs, then made it one hundred. Again, finding there was a call for knowledge on the landscape and floral arts, I have used 175 photographs, and could use more to advantage, but cannot for the money. I desire to keep the book at $1.00, so that it will be within the reach of all.

This is an age in which we do things by *lightning*. People want facts, but they must have them in a condensed form. I cover, in THE TREE DOCTOR, practically, all that has ever been written on tree culture. We herein present to the public the best photo-engravings, the best paper, with a strong cover, put up by the best of workmen and, above all, knowledge that it has taken the author more than thirty-five years to acquire. You pay a dollar for a tree, shrub or plant, then lose it. You try again and lose it, because you know not how to proceed. I have known people to order over twenty dollars' worth at once, and have it nearly all die. THE TREE DOCTOR will prevent all this waste of money and inspire its readers with the ambition to add new beauties around their homes. All scientific terms are avoided. The language used is chosen so that it will convey a knowledge of the facts to the ablest scholars of the land, or to the merchant, farmer, mechanic, laborer, man or woman, boy or girl.

The time has come when *tree planting* and *tree culture* must be studied in connection with the *physiology of plant life*. If this is not done, a calamity will befall the inhabitants of these fruitful regions to an extent that no human mind can conceive.

There are no people on this earth who are blessed with such a scope of territory, range of climate, variety of soil and general adaptation to fruit-growing as those of North America. But we are confronted with the appalling fact that, unless something is done to arrest the diseases and check the ravages of the untold billions of insect pests which prey upon our apple trees, inside of ten years it will be next thing to impossible to grow even *defective apples!* For the last twenty years there has been a gradual decrease in the quality of this most desirable and staple fruit. Similar difficulties are being encountered in the attempts to grow the peach, pear, plum, and other fruits; and shade trees are going to pieces. The whole country is getting alarmed over the disasters that await us from the destruction of our fruit crops, and many of our ablest writers have done nobly in their efforts to stay this on-coming tide of evil. Though much good has been done, for some reason no one has "laid the ax at the root" of the trouble. Something has been said about every evil from which the tree suffers except *two*, and to these *two* all the other evils are traceable.

The author of THE TREE DOCTOR has had the care of trees and plants for more than thirty-five years and is an ardent lover of nature. The ghastly wounds of his friends, the trees, and their various suffering (if you will allow the expression) cry aloud and pierce his inmost soul and bid him arise and plead their cause The author is not so conceited to suppose he "knows it all." Whatever knowledge he possesses he has learned from others, or gained it from observation. If nature has endowed him with the faculty of observing and the ability to trace effects back to their causes, and thus enable him to find the *two real causes* of the present sickness and premature death of trees, then, as a member of society, he owes that knowledge to the world at large, and particularly to the United States of America, his adopted and beloved "*home*" to which, with pleasure, he reverently dedicates this work.

THE AUTHOR.

Photo 1.

DEPARTMENT I. Tree Surgery.

Photo 1 presents to you three Fallawalder apples. The middle one, 4 inches in diameter, is from a perfect tree, or as near perfect as we could find. Its fruit was all similar to the specimen herein shown. The other two are the same variety. The one at the left presents the "nose," the one to the right the "stem" end. Probably six bushels of this defective fruit could have been picked up under the tree, at the same time there

Photo 2.

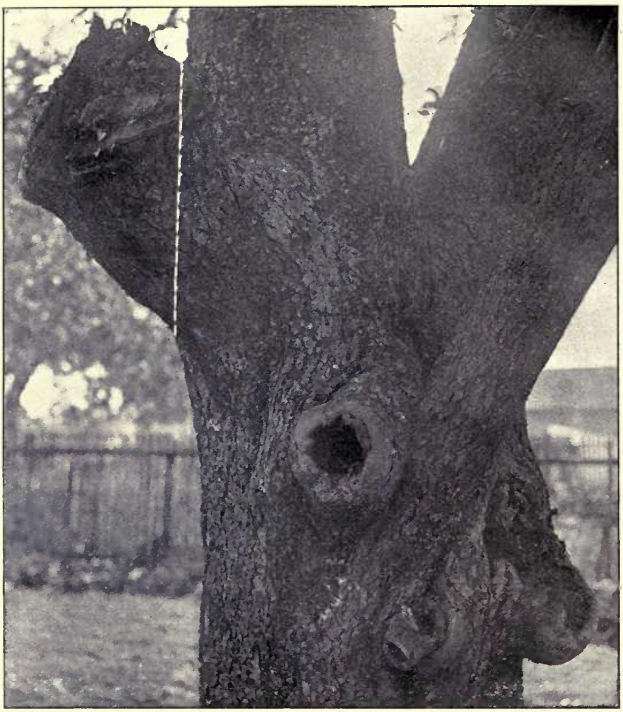

Photo 3.

was not one sound apple on it. Why? Look at the slaughtered trunk and branches below, in photo 2. This tree is rotten clear through its whole body, and the microscope reveals the decay in the twigs, and in the "water-sprouts" it is visible to the naked eye.

The failure to obtain sound apples, the one most desirable and staple of fruits, is producing grave apprehensions throughout the United States. Apples, even from some of the western states, where there are but comparatively few insects, are becoming defective, and the tendency is to blame it all to the rapid invasion of insect pests. Scarcely anyone seems to think that it is *we* unwise creatures who have *created the conditions* for this alarming increase of our enemies, the innumerable billions of insects. In the front of your house is a tree whose branches intercept your view. This you will not tolerate. You get the ax and saw and call the hired man: "Ho! James; come here. I want you to trim that tree." James goes to work at it, following your directions, or using his best judgment. Sir, or madam, you have spent your money freely to procure your fruit and shade trees, and now, after kind nature has lent her assistance to give you favorable results, you unintentionally commit one of the gravest of blunders. If your child's arm or leg has to be amputated, whom do you call to perform the operation?

Do you send for the butcher, because he can do a quick and cheap job? No! The time it takes and what it costs are scarcely thought of. There is a *life* at stake, and the most skilful surgeon you can procure is the one you will endeavor to get. Did you ever stop to think, for a moment, that the tree has *life* just as really as you have? You know

Photo 4.

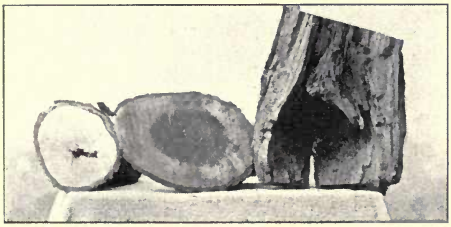

Photo 5.

Photo 6.

this to be a fact, but the question I present is, have you *thought* over it? The human being and the tree both have to feed to live; both have circulation, one a red fluid which we call "blood"; the other a transparent fluid which we call "sap." Both have their seasons of activity and rest. The human being has the period of infancy, childhood, maturity and old age. The trees *would have* these stages, but we kill them (or many of them) before they are "of age." It matters not if we do this unwittingly; natural "law excuses no one's ignorance" any more than civil law does.

Imagine that in some city there is a concern established, called "The Mutilating, Chopping and Destroying Bureau," and the only recommendation they present is "speed." William Brown, a mail-carrier, comes in to have a foot off. He places his limb on the block; one vigorous "whack" and the job is done. "Take your mail-pouch, William; hustle off and make your deliveries. You will bleed some, and find it a little inconvenient to get used to the stub, but all will be O. K. if you won't meddle with the wound!" Here comes John Adams, a penman; his right hand bothers him a little. "Lay that arm down here, John." "Ca-whack!" The job is done! "Move on! You need pay no attention to the streaming veins and arteries; put on a handful of mud now and then, and if the flies 'blow' in the wound, don't disturb the maggots!"

Such proceedings would not be any more outrageous

against life than what we have been doing with trees. Talking with a practical and well-read man awhile ago, he said that no one should be allowed to prune a tree, unless he held a certificate showing that he was qualified. That would be preferable to the present destruction. But the better way is to educate *all people*. This is the purpose of THE TREE DOCTOR.

The first thing to be considered before you sever a limb is, "*Where* shall I cut?" In photo 4 you will see three specimens. Study the one to the left. You will notice a "stub" left on the branch about as you will commonly see them after the tree has been "trimmed" by the average person, who has not made a study of this very important subject. This stub rots back to a certain point called the "shoulder."

The middle specimen, in that photo, shows you a case a year after the cut was made. The bark is decayed and peeled off, and to the right is an example of the invariable outcome. It takes six or seven years for this stub to rot and drop out. Nature struggles in every way to heal over the wound, but cannot do it while the obstacle is in the way. The reason why this stub dies is because there are no latent buds remaining to be excited and started into growth, thereby preserving a circulation, as shown in photo 6. In photo 5 the same specimens are turned so that you can see how the wood is affected.

Looking back at the middle specimen of photo 4, you will see that the stub has dried, because it has been exposed to rain, frost, snow, etc. The result is, decay has set in and has run into the trunk of the tree, as you can see by looking at the same piece turned over in photo 5. In this (photo 5), if you examine the right-hand specimen, you will see that by the time the stub decays and drops out, the rot has gone down into the trunk and up into the branches. This answers to blood poisoning in the human body. This dead tissue, as before stated, is carried to the farthermost twigs, causing "specks," "dry rot," etc., in the fruit. If you turn back to photo 3, you will see what destructive work has been perpetrated on an otherwise fine specimen of Summer Rambo apple tree. Directly in front of you is a wound where a stub was left till it rotted out. The birds have dug clear into the heart of the tree. To the right is an old sore, larger still. A year ago, in order to plow in a little closer, the farmer took his ax and slashed off the huge limb at the left, leaving, as you can see, a stub over a foot long. In order to have removed this limb a sharp saw, with plenty of "set," should have been used, and the cut should have been made close to the larger, upright branch, where the line is placed. (For cutting large branches, see elsewhere.)

You will hear all kinds of "hobbies" as to how a tree should be "pruned"; but, the fact is, when a branch has to come off entire, there is but one correct place to make the cut. Turn again to photo 4. In the left-hand specimen the saw has been run in and a piece of paper is placed there. About 2 inches to the right of the paper is a prominence, which is what we call the "shoulder." At this place nature always makes a vigorous effort to heal. This is a very strong point that connects the limb with the trunk of the tree. It answers to the "socket" of the arm. If you look at the middle subject, in that photo, you will see what an effort nature made in one year to heal at this shoulder, but could not, because the dry stub was in the way. Look still farther to the right-hand one, and see what a desperate attempt was made to close in after the decaying piece that stood in the way and conveyed the air, water and frost down the wood fibre, where it wrought such destructive work! If you turn to photo 17, you will see these "shoulders" very plain in that maple. The maple shows this prominence much more distinctly than some other species. It is also very plain in photo 16, by the side of which the high-school girl is standing. Look at the hole that is rotted into this fine cut of timber! See the decaying stub, also, above. If you will examine the trees that go down in windstorms, you will find nearly all are defective. (Those destroyed by cyclones are sometimes exceptions.)

I have told you *where to cut*, and it may be well to add a few words *how to perform* the act. There is a strong tendency for some of the wood and bark to split down. Sometimes, if care is not taken, the bark will split down several feet. To avoid this, it

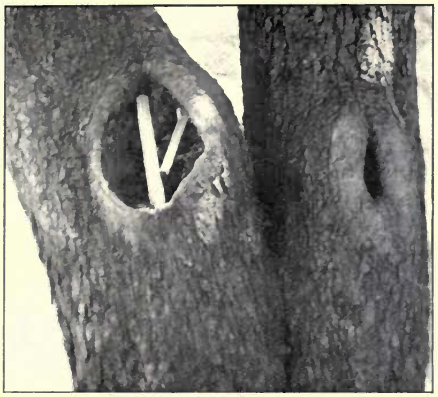

Photo 7.

Photo 8.

Photo 9.

is customary to cut *up under*. A much better way is to cut the whole branch off, out, say, two feet from the trunk. This relieves the heavy weight. Then you can start the saw at the "shoulder" and can easily manage the remaining stub. Sometimes the branch is so attached that you cannot get behind it with a saw. In such cases, those who can swing an ax well can make a good, clean cut with that implement, striking *up* from under. Those who are unaccustomed to the ax should use a large chisel, as shown in photo 11. Never leave the wound hacked and lacerated. Cutting upward with the grain is essential.

DRESSING THE WOUNDS.

I have never seen the matter of dressing the wounds presented with one-tenth of the strength that it should be. The wounds not only "ought to be painted," but positively they *must be*, or the premature death of your tree will follow. Look at photo 7. This is a "crotched" apple tree. You behold two old sores. The cut was made in the right place in both cases, but it was not painted. See what excellent efforts nature has made in both to cover up the wound! But the action of frost, air and rain have done their deadly work. In photo 8 this same tree is presented, with the worst of the old sores traced down—uncovered. What a nauseating sight! And yet this is not half as bad as two-thirds of the apple orchards of Ohio. From such trees you expect sound fruit, do

Photo 10.

you? As before remarked, you have not purposely wrought such destructive work; it is a deplorable oversight. But nature is meeting out a just retribution. She is sending you to market with the "specked," wormy and half rotten fruit, which is everywhere offered for sale.

This last season I have kept close watch of the Cleveland markets. At Chandler & Rudd's, O'Brien's and other places, where they pay the highest prices for the *best* of everything, I have not found one sound bushel of apples. Indeed, it is a rare thing to find *one* sound apple in a whole bushel. This dire calamity is to be traced largely to the wounded trees. Such "blood poisoning," if you will allow the expression, affects the fruit directly. Also the wounds and decayed wood become the lurking place for countless billions of insects.

This whole matter should be taken hold of with vigor, not only by the pomological, horticultural and agricultural societies, but by the masses in general.

Photo 11.

Photo 12.

Photo 13.

Let us return to the study of our photographs. In photo 9 you have an example where the snow and ice broke down a large branch. The wound was not attended to for some three years. The old, dead wood has now been dug out and a heavy coat of paint applied. The tree is badly damaged, but if this wound be dressed every year, it will last, probably, a long time. Photo 10 presents another old sore that had been doctored. This is a genuine Rock Maple. The tree is in excellent condition in all other respects. A branch was cut off and allowed to split the bark down. The wound was not dressed. It was exposed for some six or seven years. Finally the owner called on us to attend to it. We found that the rot had penetrated nearly to the heart of the tree. By the use of a mallet and chisel all the decaying bark and wood was removed. The process was much the same as a surgeon would adopt in scraping a diseased bone. Everything was cut away until healthy wood was reached. Then the cavity was filled in with putty, using a mallet and a short piece of wood, driving the putty in solid. Then it was painted. It was not seen for two years. It was then discovered that the lower part of the cavity had not been cut quite slanting enough, and the water had lodged there, causing decay to start in again. But if you will observe the upper portion around the putty, you will see what a most excellent healing operation has been going on.

In photo 23 you have another example of what evil can be done by allowing the bark to split down and the neglect of dressing the wound. The huge cavity where the lady's hand is presents to you one of those cases. The whole block of wood which you see is the "head" of an apple tree. It is the junction of the stem and large branches. The point facing you, where it has been sawed off, was the upper part of the trunk. By this you can see how the rot ran *down*. In the photo below (24) you have the same block turned around. By this you will observe how the action of decay traveled *up* into the main arms. As before stated, if you trace this decay with the microscope you will find that the tree is affected, root and branch, to the farthest extremities. And yet, from this you would

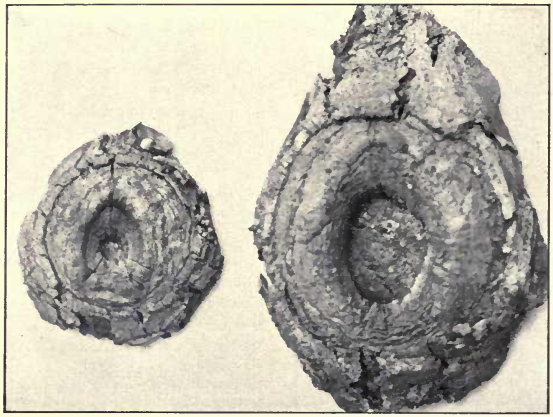

Photo 14.

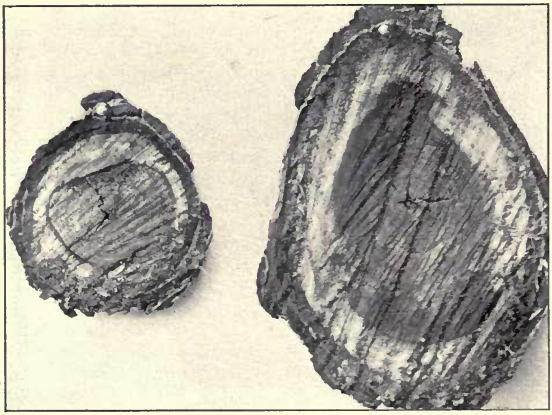

Photo 15.

expect sound apples, would you? This tree, like all such, became a victim of a wind storm. If you turn back again to photo 4, to the left-hand specimen, you will see where the piece of paper is laid in. It would be a mistake in pruning to cut at that point, because you would not only be cutting nearly lengthwise with the wood fibre (grain of the wood), but you would inflict an unnecessarily large wound. If you cut at the "shoulder" the sap comes up from all directions, from under, from the top and sides. If the wound be dressed thoroughly with thick paint a healthly granulation will immediately set in, provided it be the right time of the year. A fine specimen of healing is presented in photo 18. This is hard maple; it was cut at the "shoulder" and well painted. You can observe the saw marks through the paint. The new bark, somewhat resembling a horseshoe, is the work of only forty-two days. This is what nature will do when you lend a

Photo 16.

Photo 17.

little assistance. Years ago careful orchardists used to apply grafting-wax and other preparations to wounds, but later experience has proven that nothing is better than good, thick paint (no matter what color). It should be applied to all wounds more than half an inch in diameter. All large wounds should be painted twice a year.

"*How large a limb can I cut?*" is a question frequently asked. Let photo 19 answer this. Here is a wound nearly two feet long. It has been well painted, and granulation is setting in finely, especially where the boy's right hand is. This limb constituted nearly one-fourth of the tree, but it made the tree lop-sided. In looking at this photo your back is supposed to be to the east. Photo 20 is the same tree with your back to the north. By this you will learn that the cut was made in a straight, perpendicular line with the main trunk, or, if anything, a little "dished," so that when it heals the line will be straight. In photo 21 is a large wound more than half healed over, and in 22 is a wound on an oak, 15 inches in diameter, completely healed in the most perfect manner. Small-sized wounds (3 or 4 inches in diameter) will heal over, if the cut is made in the right place, even though the wound be not dressed. Photo 12 (from a horse-chestnut tree) presents this fact. Photo 13 is the same piece turned around. Beneath that nicely healed wound was a rotten mass of wood fibre running into the main branch 5 or 6 inches. The poor tree, however, was not to blame. The evil must be charged up to some "tree butcher." Photo 14 shows you two specimens from an elm tree. They were properly cut and well dressed. Photo 15 is the same reversed. You can see, even in the photo, that the wood is solid. The "hearts," or dark centers, are so hard that if you tap on them they sound like metal.

"*When is the proper time to prune?*" This question comes from almost everyone interested in a tree or plant. Many excellent authorities advocate winter pruning. While I have no serious objection to offer against the fall and winter months; yet, most decidedly, I have had the best results in the growing season. Everyone, however, should avoid pruning when the sap starts into an active flow, for two reasons. First, the bark will very easily strip down, even on small branches; and second, the sap is thin and flows so copiously that it is sometimes almost impossible to make paint adhere to the wound. There is a common rule among the German farmers (and it's a good one), "start to prune when the apple trees are in bloom." The sap has then become sufficiently thickened that the tree will not "bleed." Moreover, you can then see all dead or defective

Photo 18.

branches. You can prune with safety from this time till the leaves fall, and the work can be executed with pleasure.

Don't depend on "hobos," adventurers and imposters who have "nerve" enough to pose as "tree trimmers." There is a story of an Irishman who claimed to understand the art of "trimming" trees. He was sent, one morning, to trim the orchard. At noon his boss inquired how he was progressing. "An' fath, sur, Oi've got them all cut down, an' Oi'll trim them up this afternoon," was his report. It would be about as well for the average tree-butcher to follow Pat's example as to cut off one-half and start the other dying. Study the life of your plants and trees and learn to do your own tree surgery, or direct it personally. The wind sometimes will split a branch clear to the ground. Photo 25 is an example . The wood, however, was painted and is being preserved in a solid condition. Photo 26 is another specimen, but the wound has not been dressed. It is a sickening sight of dead wood fibre and haunts for innumerable hosts of insects. It is a Rambo tree, but the fruit has scarcely a trace of that delicious variety; it has a flat, soggy, dead-wood taste. Photo 27 is also an apple tree, and some years ago was struck by a plow, drag or something of the kind. The fruit is about as worthless as the preceding Rambo. People are sometimes very thoughtless when working around trees, but the penalty must be paid for all violation of nature's laws. In planting orchards, farmers would do well to use the simple tree guard shown in photo 100. It will pay you well to keep your trees clean. Photo 28 shows a boy " currying the tree." He is using an old currycomb, and the little folks are around him learning how to do it. A tree will thrive by being cleaned just as much as a horse will; besides, you destroy the shelter of your enemies, the insects. An acquaintance of mine told me that some years ago he climbed into an old apple tree to remove some branches. He had on an old pair of buckskin gloves. He commenced to rub off the old bark, and he *fussed* and *worked* and *rubbed* till he had cleaned the whole tree. This destroyed the abode of insects and admitted light, air and moisture to the hide-bound tree. The result was, as he said, "a new lease of life to the tree, and an abundance of fine fruit." Keep your trees clean.

NOW FOR A CHANGE!

You have been vexed and irritated by seeing how our friends, the trees, can be mutilated and destroyed by the ruthless hand of unqualified persons. Now we turn to a few of nature's majestic beauties. If you glance at photo 29 you will learn how nature plants a tree. She drops a seed *on* the ground, then blows a few leaves or some other substance on it, enough to keep it moist while the seed germinates. The radicle penetrates the soil and throws out some tiny little white rootlets, which, in this case, have become the powerful bracing roots before you, which now hold this gigantic elm to its mooring. It is some 14 feet across from one root to the other, as you see it, on the surface of the soil. As the delicate little infant plant pushed forth from its embryotic state a mouse might have clipped it off and scarcely felt anything between its teeth; the foot of a clumsy toad might have snapped it off, or "a dew-drop on this baby plant have warped this giant elm forever."

Photo 19.

This venerable old friend was born, probably, about the period when the Indians pursued Captain Samuel Brady, compelling the heroic Brady to make a leap of 22 feet, clearing the Cuyahoga River at the Narrows, about a mile east of this healthy veteran of the native forest, which stands here now a rebuke to ignorant "tree-butchers." What a study there is in this tree for young people. When the radicle (taproot) had gone down a little and commenced its work, then the plumule shot up, bearing with it the cotyledons, or seed leaves.

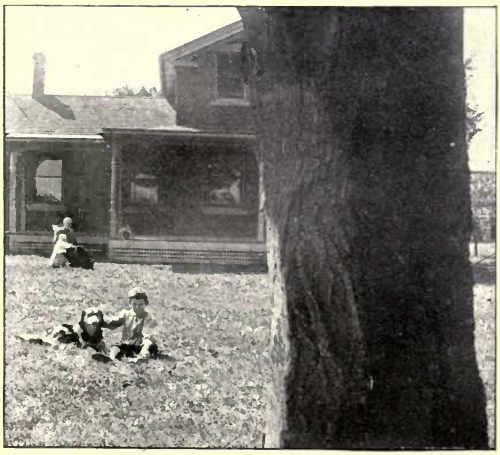

Photo 20.

Photo 21.

The process of tree-building has gone on year after year till now you see a mammoth beauty about a hundred and fifty feet high. You are presented with a view of this plant across one of the celery fields adjoining (photo 30). The tree is the tallest one to the right. A violent cyclone tore a branch from it some few years ago, as it did also from its neighbor.

(Many of our readers probably never saw celery growing on a large scale. This is the White Plume variety, taken under a strong sunlight. This is a part of Pleasant Valley Celery Farm, at Kent, Ohio. If you get hungry for good celery, better write them.)

It appears that trees are like persons—some born to reach the top round in the ladder of fame, while the masses pass into oblivion as if they never had existed. Photo 31 is a good example of the "sugar maple" of Northeastern Ohio. It has been "trimmed," but not by an ignorant man. The "tree-butcher" would have killed it years ago. The "trimming," you will notice, has been performed in a very systematic manner. The "professors" who had the job in charge were horses and cattle; they nibbled off the branches as high as they could reach. The upper parts of the tree have adjusted themselves to the light and air. The top leans a little in a northeasterly direction. You will see hundreds of trees that lean in this way. It is due to the steady breezes that blow from the west and southwest. Photo 87 is an example of this. This tree is a young elm. It is situated where the wind, after coming over a hill, becomes compressed and keeps a steady pressure on it, and the tender branches grow where they are kept by the force of the wind. The remedy is to cut off the branches where the lines are, leaving a heavier portion of the head on the side toward the wind. Dress the wounds as directed under that head. Cut off all branches under the horizontal line and all to the left of the vertical one. Photo 32 exhibits a lovely maple about seventy feet high. The picture was taken at quite a distance and during a strong wind, which shook the camera and slightly blurred the picture. You will observe how nicely this, also, is "trimmed." Prince and Dick and Charley and Bossy have done this at their leisure, while they stamped and switched off the flies. You will notice in this case, also, how mother (nature) has taken care of the upper stories. The one great lesson that mother thus teaches us is, *form the top the right height and then keep hands off.* It is the desire of the author of this work that you study, above any other part, the lessons on *planting*, and *forming* the tops of trees. See elsewhere.

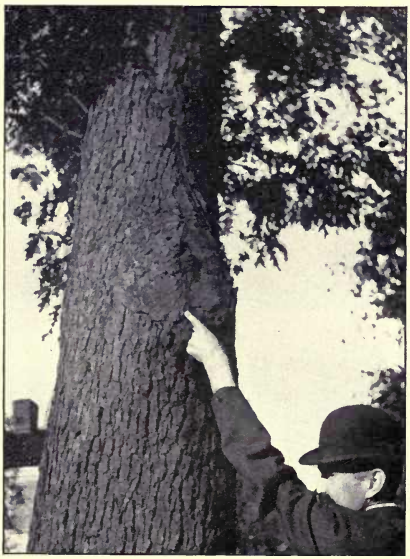

Photo 22.

Photo 23.

Photo 24.

Photo 34 shows you a basswood tree. The horses and cattle "trimmed" this, also. It has now been enclosed in a new part of a cemetery. The basswood makes a fine shade tree. It has strong lateral branches, and it is one of the best honey-producing plants we have. Plant more of them. Photo 33 presents to your view a genuine sugar maple, the same as in 31. This grew up in the forest and was allowed to stand in the "clearing." The land around it has been cultivated for more than twenty years. The trunk is some 3 feet through at the base, and the owner is careful not to have it marred. This tree shows you that you can form the top at any height you please. You can have the branches drag on the ground, or form the head 33 feet from the ground, as this is. Photo 35 gives you two mammoth oaks, remnants of the forest. The picture does not do them justice. They are so large the camera would not take them in when near by. The right-hand one is some 6 feet through at the base. The principal thing we want you to observe in this is their powerful arms. Whether the "tree-butcher" has been kept away from these oaks with the broom stick or shotgun, I know not, but they are fine object lessons, as are the others preceding. They all teach what your trees "might have been" under right conditions, and we know, kind readers, that you have invested your money for the purpose of acquiring such majestic beauties; and though you have failed, if you will follow the teachings of THE TREE DOCTOR in planting and trimming trees, you or your descendants shall attain unto this desirable end.

Photo 36 shows you a young rock, or sugar maple. Though these are slower growing than the soft maple, yet it pays to wait for their strong makeup and beauty of foliage.

WHAT THE TELEPHONE AND TELEGRAPH COMPANIES DO.

Photo 37 gives you a view of a handsome row of young rock maples. They were the pride of the owner of the farm. They were planted in the fence row. Looking down the road you will see that the street bends a little to the right. The trees were continued

down that line. The owner of the property fell sick. During his absence the telephone company came along, keeping to the left. When they came to the bend in the road they crossed over and planted their poles by the young trees, and cut perpendicular, taking off one-half of the trees. Photo 38 will give you some idea of their slaughter, though the picture is not very plain. Photo 40 shows you how they slaughtered one of the most symmetrical maples that could be found anywhere. Photo 39 reveals their fiendish work on two grand oaks. Whether such fellows should be put into the "pen," hanged, shot or drowned, or all of it, is difficult to say, but farmers are a consummate lot of fools to allow such destruction of trees and consequent depreciation of property. Telephone and telegraph companies are in business for the money that is in it, and let them buy the right of way through the open field, which is the proper place to go.

Photo 25.

FORKED OR CROTCHED TREES

are the most difficult class of trees to prune, and "doctored" they must be or the winds, snow and sleet will destroy them. Photo 41 had a very graceful top and was highly prized by the owner. He saw the danger and placed the chain around it. The tree grew and the chain cut into the bark. With the pressure from the growth and the friction from the swaying of the tree by the wind, it became completely girdled; death was the result. Photo 42 is another example. This tree could have been saved if a bolt had been put through at the point indicated by the line. Both this and the foregoing tree are maples. There is one variety of hard maple that has a strong tendency to be crotched. The largest tree in photo 40 is one of that variety. Contrast this one with the strong-armed rock maple in photo 36. Soft maples, also, are very apt to be forked. Elms, too, have a great tendency to this weak

Photo 26.

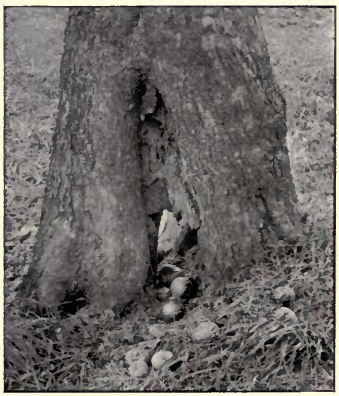

Photo 27.

Photo 28.

form of branching; photo 43 is an example. This is a very large tree and was in perfect pealth, but it went to pieces in a wind-storm. It is now completely ruined. It should have had two bolts of inch iron or steel. The upper bolt would have held the two branches indicated, and the lower one in like manner. Apple trees, also, have a great tendency to crotchiness. They should be watched and bolted. Photo 45 is an example of unexpected trouble. There was no particular sign of weakness in this case. But it had been gradually weakened and the water had found its way in, followed by a slight rot down as far as the cross line. Just the weight of the crop or apples broke it down. I speak of the *bolt*, as that is the best method of *preventing* the trouble. Chains and bands are objectionable on account of their "chafing" tendencies. In photo 44 you have a case of a large maple split clear to the ground. It gaped with every wind-storm. Two ⅞ bolts were used at a point where the bits of paper are tacked on. It is nine years since this was bolted. Putty and old dregs of paint were worked into the crevices above to keep out the water, and a wonderful process of healing has been going on down the wounded sides of the trunk. But this tree has recently taught a valuable lesson. A violent wind-storm tore off one-half of the top, just where the bolt was put through, revealing to what an alarming extent decay had penetrated and weakened the wood before the tree was drawn together with bolts. We commonly practice bolting in the way shown on the horse-chestnut in photo 46. The bolt might have been put as high as indicated by the right hand. The higher the bolt the less the strain from above. Always fill in around the bolt with putty or thick paint to exclude the air and moisture.

To show you how common it is for trees to be crotchy, we call your attention to photo 47. These are fairly healthy elms, but no less than five of them that you can see are so badly forked that they will be torn to pieces by the wind. The only way to prolong the life of that row of trees would be to bolt them or lop off the tops as in photo 90. In some situations it is well to do both. In photo 90 the trees are so exposed that the top of one was torn clear off, and others probably would have been destroyed had not the tops been shortened. In this operation great care should be taken to paint the wounds, as it is difficult to get to them again. It is a very tedious piece of work to perform. Light ladders had to be fastened with strong ropes to the main branches to get

Photo 29.

up to the work, and the tops were let down with a light pulley, so as not to demolish the fence. Photo 48 illustrates a case of temporary salvation. Just over the girl's head a piece of paper is laid into a crevice. The large branch toward the house, and constituting about one-fourth of the tree, was rent in a heavy gale the whole length of the trunk and laid on the ground. A strong double-block rope and tackle were procured, and with a team of horses the limb was drawn back into its place. . In order to hold it there a strong chain was placed around the main branches and guards of double thickness of

Photo 30.

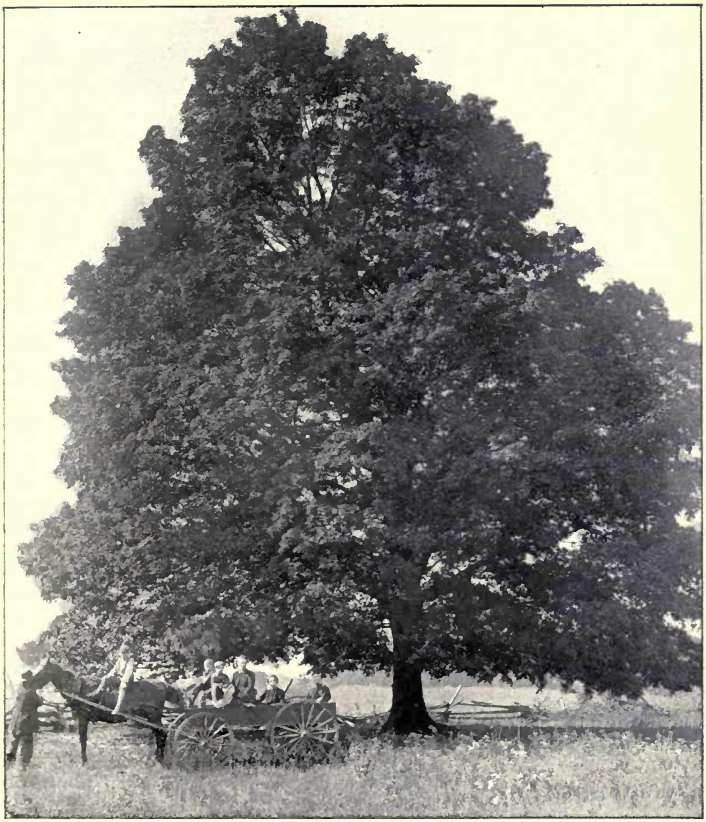

Photo 31.

galvanized iron were put between the limbs and chain. The tree is practically ruined, though it may last thirty or forty years, if the guards are changed and new chains supplied.

Thus far I have been showing you how to *prevent* the crotch from splitting. The better way, however, is to prevent the formation of the fork. This you can do in young trees. In photo 50 you have a case which was one of the worst kind. There was a very bad fork at the upper cross line and another at the lower one. The remedy was to cut everything clean off, making a bean-pole of the stem. It shocked the owner, but he has long since recovered and is delighted with the strong lateral branches which the wind might possibly *break* off, but it cannot *split* them off. Photo 49 is the same tree in foliage. It would be an improvement if all branches were cut off below the bottom line.

ONE GREAT EVIL.

Now, put away everything else out of your thoughts and consider this *one fact* alone till it be indelibly fixed in your mind, namely: *The roots of every tree are proportional in extent to the branches.* We commence this series of lessons with photo 52. This is a

Photo 32.

Photo 33.

Photo 34.

small elm. Go from this to photos 53 and 54. This is a maple, started on its fifth year's growth. The middle part of the stem is cut out so that both root and branch can be shown on one page. The size of this plant you can see as compared with the boy's hand. The stem is not much larger than his thumb. Look closely at both pictures. If the leaves were off, the root would appear as large, if not larger, than the top.

Now turn to that majestic maple, photo 31. Imagine some gigantic hand lifting this tree out of the ground and plunging it into some lake and washing off all the soil and then holding it up to view; and suppose the leaves were all off, what would you see? You would see this, viz.: *The roots*, when averaged up, *cover as much surface as the branches*. If the tree could be lifted during its working season, you would see, probably, from five to ten times as many of those delicate little fibrous, feeding rootlets as you have twigs. And where are these feeders situated? At the extreme end of the other little roots. Now, what do we learn from this fact. Simply this, namely: If these feeders are not taken up when you lift the plant, such a plant will suffer in proportion to the roots you have destroyed. Large trees can be moved and it is often done. Trees with trunks 4 feet in diameter have been taken up and replanted with success, but it takes powerful machinery to do it. The average person desiring a tree would want to pay not more than a few dollars. Suppose you wanted to move the maple in photo 49. The base of that tree is about 8 inches in diameter. The diameter of the top is from 12 to 15 feet. Then you must go at least 6 feet from the tree to get your feeding roots. This can be done, but a clump of earth 12 feet in diameter

Photo 35.

and from 2 to 3 feet deep is not easily handled, and not one out of a thousand would attempt such a task. The usual way is to "grub" them out, something like the tree lying on the ground in photo 51, and though they take great pains with the planting, they very often have the trouble of pulling them out in a condition like that which the gentleman is holding up for inspection. If the feeding-roots are not preserved there is but one thing to do, and that is *cut off* the top in the same proportion that you have destroyed the rootlets. Then you have injured the breathing and circulating power of the plant to the extent of the removal of its foliage. This is followed by a cessation of heart growth. Photo 55 exhibits this fact. This is a section of a tree about 12 inches in diameter. Death set in at the center, at the dark spot where the finger is pointing. This tree, like tens of thousands of others, had not foliage nor rootlets enough to supply even the trunk with moisture. The result was, the sun dried the bark up and it peeled off. This usually happens on the south side, or a little west of that, where the sun strikes it the hottest part of the day. Some very wise gentlemen will tell you, "the person who planted that tree should have marked it before he took it up. *This* (wounded part) is the side that formerly faced the north, and it should have been planted that way," etc. All there was of it is, the plant had been rendered unable to supply moisture and the bark was destroyed. The action of hard freezing after a very warm spell sometimes has a similar effect. In the latter case the bark is ruptured, torn loose; in the former *dried up*; in both cases it is *killed*. Now look at photo 58. The person

Photo 36.

Photo 37.

Photo 38.

Photo 39.

Photo 40.

examining this maple is Mr. John Paxton, the young, wide-awake and energetic editor of the Kent *Courier*. This gentleman is much interested in good trees and fine floral displays. See from his right hand clear down to the ground how the bark has been destroyed. Though nature is making most vigorous efforts to heal this over, yet the tree is utterly worthless and should be pulled out, for if it does remain and heal over it will be *hollow*, and will be blown down and possibly do damage. Take out all such trees and replace with *small, healthy* ones.

I have asserted that when the roots are thus destroyed it results in a *dead center*. This usually affects the branches in a similar manner as do the *wounds* from the "tree-butcher." The rot is carried away up into the branches. See this exhibited in photos 56 and 57. One can generally pick out such trees by the dead twigs interspersed in the top. Sometimes a tree may be planted in a very favorable situation and will do so well that there is no particular trace of the injury in the twigs. Photo 59 is a case of this kind, but in photo 60 you have what you can discover on close inspection. Such a tree, I say, is not safe, for it is liable to succumb to the force of a violent storm.

In photo 61 you have an example. The smaller tree to the left was quite large when planted. I think the gentleman paid $3 for it. As usual a dead center set in; the bark dried up toward the hot sun and peeled off (between the two crosses). The bark will dry up on *any side* of the tree that is exposed to the hottest sun. It may be east, west or south, but generally *south*. The tree is now doing fairly well and may make a large one, but it is *hollow* and will be a constant menace to the occupants of that house, for, being *hollow*, it may go *crashing* into the house with any severe storm.

Photo 41.

Photo 42.

YOUR SPECIAL ATTENTION is called again to photo 61. To the right you see a large tree. We have been talking of the one to the left, which was planted in 1885. We have said this tree was large and cost in proportion to its size. The other, to the right, was a little switch which the man had pulled up and thrown into his wagon. He gave it to the property-owner, who, out of curiosity, stuck it in where you see it. It started to grow, and it *grew!* and *grew!!* and *grew!!!* and is growing so fast that it seems they must move the house back or cut away a part of the tree.

Here, then, is the all-important point. Why did this plant thrive so well? For the simple reason that its *feeding roots* were not destroyed, and there was no large trunk there to become exhausted. If you go to the woods for a shade tree, by all means select something that you can pull up with your hands, instead of

Photo 43.

one that would fill a one-horse wagon. With the small tree in ten years you will be five years ahead of the large one, and (the small one), being perfectly healthy, will gain yearly over the large one in the same proportion as it has started.

Almost everyone ordering nursery stock has a mania for getting *big trees*, and are angry if large ones are not delivered to them. This is a serious mistake. It is better for you to pay *one dollar* for a tree two years old than to have a six-year-old as a gift. There is a great advantage in procuring trees from a good nursery, as nursery stock is *transplanted* from the seed-beds and, therefore, have more feeders. But, by all means, take a small plant; in shade trees not more than an inch in diameter at the base, and in fruit trees not more than half that size. I repeat, it is better for you to pay more for a *small* plant.

Photo 44.

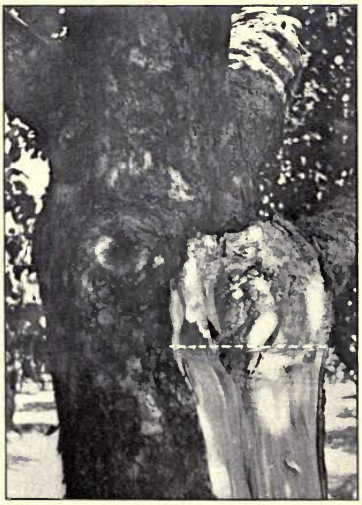

Photo 45.

THE SECOND GREAT EVIL.

Following the *one great mistake* of planting too large a tree, resulting in *dead center*, as we have shown, comes the almost universal blunder of *forming the head too low*. Nurserymen are, in part, to blame for this misleading step. It is taken for granted that the average nursery firm know their business. Photo 62 presents to you a cherry tree as the head was formed when it came from the nursery, and you have but to stop and think for a moment to recall the fact that most all trees come in a similar form. While growing in the nursery the leader was cut off where the short cross-line indicates.

Last spring (1901) two of my acquaintances ordered at the same time, from the same firm, and the trees came together. There was no noticeable difference; cherries, apples, pears and all had

Photo 46.

Photo 47.

Photo 48.

their heads formed about the same height. One of the gentlemen was a very industrious man. He set his own trees and did it carefully, but the tops were too heavy for what roots remained. All of the trees but two died. Photo 62 is one of the dead ones taken on August 19th. The other neighbor, not having confidence in himself, prevailed on us to set his trees. All the lateral (or side) branches were taken off, preserving nothing but the leader. They all grew finely. Photo 63 is one of the batch, an apple. The head had been formed in the nursery; it consisted of the leader, which is preserved, and four laterals. The four latter, at the lower cross-line, were taken off and all the force of the root was thrown into the remaining leader, resulting in a new growth of over 2 feet, starting from the terminal bud, which was situated where the long cross-line is drawn. At that point there are several healthy young shoots ready to start into activity with the opening spring. These will be all rubbed off and the head will be formed just where you see the bunch of leaves at the top. No cutting will be done for one year; then the leader will be cut out at the point which is now the top. We will thus start with the head of the tree formed about 7 feet from the ground.

Photo 49.

Photo 50.

Adding to this the elongating growth of the stem, you will have an apple tree with the head 8 feet or more in height. I repeat that the principal blame for this misguidance is attributable to the nurserymen. They never should *form the head* of the cherry, apple or pear. Neither do I see any reason why they should that of the peach or plum. They have no possible means of knowing who will purchase the stock, or in what situation the tree will be placed, or what height the head will be needed. It is true that in some localities in the west, and, indeed, in various situations throughout the land, where strong winds prevail, people will occasionally form the heads of a whole orchard of trees *low*, so that the fruit will not be violently shaken from the trees. But, admitting this fact, the man who plants thus should be able to get straight, young trees, and then clip the tops

Photo 51.

wherever he chooses. It is self-evident that the nurseries never have purposely made this blunder. It is an oversight, and it has taken time to develop the error.

The way to get small trees is, *let the people demand them.* Of course, there will be small, lateral branches; these you can remove after planting. If you desire to use your trees for wind-breaks, or to hide some unsightly objects, or for shade in the chicken yard, etc., etc., all there is of it is one slash with the pruning knife and nature will obey your mandates. In discussing this question, there is one thing above all others that I desire to impress upon you, viz.: When you plant a shade tree *form the top the desired height and then keep hands off!* Leave nature alone, with the exception of cutting out interfering branches, or clipping the ends of drooping ones; or, possibly, when the tree is young, shortening the leader to make the head more bushy. By *interfering branches* we mean those that cross each other. An example is given in photo 64. By the constant friction with the wind they cut through the bark and grind one into the other. Decay is the result, and it runs up into the smaller branches as shown in the photo. Remove all such. There is also a constant tendency for the lower limbs to droop by the weight of the foliage, rain, snow, etc. With some kinds of oaks, elms and maples, if you were to form the top 15 feet high, in time the tips of the lower branches would touch the ground.

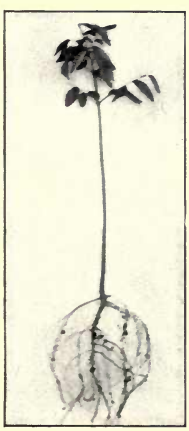

Photo 52.

In planting shade trees, unless you desire to shut off the view of some undesirable objects, form the top from 12 to 15 feet high. This is very easily done if you plant a *small tree.* Photo 65 shows you that the lady can take charge of such fascinating work. That tree was set two years ago, and the top clipped off. Now the lady bends it down and clips the tops of the half dozen vigorous young shoots that have started. This makes the head more *bushy.* The tree is no larger than a common broom handle, and the stem is about 14 feet long.

Photo 66 presents to you an early Richmond cherry tree. It is very healthy and has a nicely-formed top. The head is strong and formed about 7 feet from the ground. Photo 67 is a maple with the lower branches about 8 feet from the ground.

Photo 53.

Photo 54.

Photo 55.

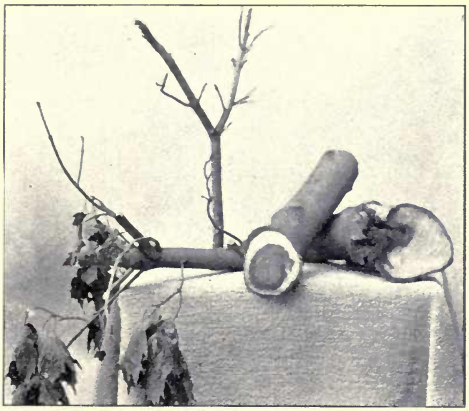

Photo 57.

It would be well to form apple orchards nearly or quite that height.

W. I. Chamberlin, editor of *The Ohio Farmer*, is a wise man. He has a large orchard, the heads of whose trees are formed in this way. Photo 68 gives you a partial view of said orchard with Mr. Chamberlin under a bending limb of apples, which hardly reaches his head. He plows and cultivates right under the trees. This photo was taken about the middle of August. In a drive of some twenty miles that day, all other orchards were about alike. They looked dried, famished and root-bound, with here and there a few gnarly apples. But Mr. Chamberlin's had been plowed and sowed to Hungarian grass, which he said he would cut and put under the trees to prevent the bruising of the fruit

Photo 56.

Photo 58.

Photo 59.

and to mulch the roots and feed the trees. Wise man! I hear he made some $2,000 from his crop. He told me he had "sprayed" twice, and it is certain that I never saw a firmer, healthier growth of wood than the whole orchard presented right in the month of August, a strong argument in favor of *cultivating*.

Photo 60.

Some say that they would prefer fruit trees to the maple, elm, etc., for shade. Well, if that is your choice you could have your wishes gratified. Photo 69 shows you what "might have been" in the way of a shade tree. This is one of the well-known Baldwin apple trees. Look at its powerful arms. It is over 60 feet in diameter of branches. Suppose the head had been started up at the second tier of limbs, instead of down low, and suppose that no "tree-butcher" had assailed it, as you see they have, what a magnificent sight it would be, and how pleasant thirty or forty bushels of nice Baldwins would look in the cellar! Photo 70 shows you a nice young maple with the head formed about 12 feet from the ground Photo 71 gives us the wise and unwise methods of planting for shade. In this picture you will notice two houses to the left, upon which the flitting shadows

Photo 61.

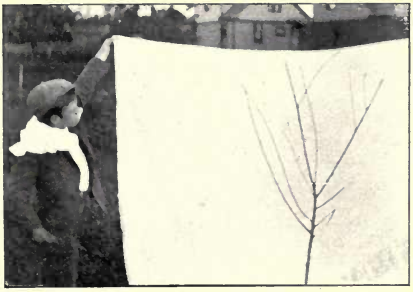

Photo 62.

Photo 63.

of the overhanging trees are playing. These trees are hickories and oaks. They are the second growth of the native forest. You notice they are free from branches to the height of the eaves of the houses. In the heat of summer it is always cool under them, and, the light and air not being obstructed, there is a strong, heavy sod on the lawns. To the right is a new house and no trees in front, except the one that the gentleman has his hand on. This plant came from the nursery, and the head was formed less than 6 feet from the ground. Mr. and Mrs. Miller are discussing what is best to do with such a tree. It is a healthy plant, but there is no leader. The proper thing to do is, take it up and set it somewhere else and put another here, and *form the top at least as high as the eaves of the porch.*

Does the stress that I put on forming the head so high seem too strong? Well, how many are there who desire to have their front or side view shut off? You may find one in ten thousand with that queer notion, but most people like to "see out," and if you have a good house others like to "see in."

Photo 64.

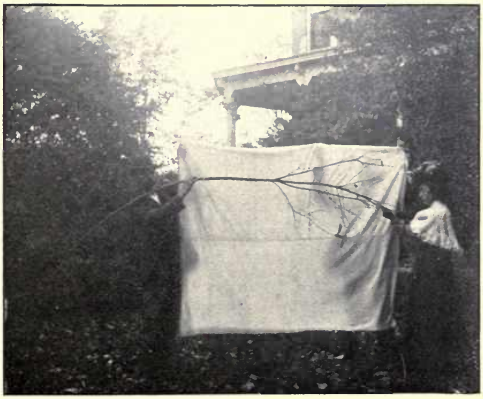

Photo 65.

Photo 66.

A FEW EXAMPLES

Photo 67.

will now be presented which will exemplify the folly of forming the head of the tree too low. Photo 73 shows you what is commonly called a "buckeye." This is not the buckeye proper (that is a native of America), but the English horse-chestnut. This tree stands directly in front of a very nice house on the most prominent street of the town. Who wants the view intercepted in this way? What shall be done with it? Put the "tree-butcher" at it? No! For what he does not cut off he will kill! It was a wrong place to plant it, but if the owner insisted on it, the formation of the top should have been where the line is run across. The tree then would have been majestic. Now, probably, it will be taken out. Painful to think of it, for it is one of the healthiest trees that ever grew.

We call your attention again to the larger tree in photo 61. There is an excellent, up-to-date house back of it. In the first place, this tree is too close to the house, but if it had to go there the head should have been formed not lower than the cross line. Photo 72 also teaches a strong lesson. This is a very prominent street. You see a row of very healthy young maples; the tops are very symmetrical. These trees were planted in 1884. There are three of the handsomest houses in the village hidden behind them. This

Photo 68.

Photo 69.

obstruction of view won't be long tolerated; the "tree-butcher" will probably be put to work. Then could those trees but speak! How deplorable to have such beauties cut to pieces! Had those heads been formed where the line indicates, the view, both from within and without, would have been all that could be desired.

In photo 74 you have glimpses of some very healthy maples in front of the beautiful M. E. Church in the city of Kent, Ohio. Photo 75 shows you the same after being pruned. There is a row of these clear up the hill, but the tops were so low that they interfered with umbrellas and prevented seeing more than half way up or down the hill. Now the view is fine, as you will see by photo 76. Photo 77 presents a most charming sight. It is a row of maples planted some fifty years ago. They are east of the city of Kent. Unfortunately, as in most all cases, they were not started high enough. The branches drag on buggy tops and other vehicles. Unless great caution be taken the "tree-butcher" will put in some of his destructive work on them. What grandeur there is in perfect trees, and how much they enhance the value of real estate. Take by way of contrast with the foregoing picture, the one numbered 78. Here you have little trees, big trees, live trees, dead tree, etc., disproving the assertion that "variety is the spice of life;" at any rate, it is not in this case.

Photo 70.

Photo 71.

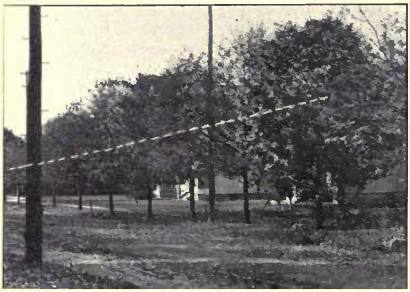

Photo 72.

Photo 73.

For the last few years there has been a great rage on the Carolina poplar. They are immense growers, especially where they can get to moisture. You can see what a rapid growth they make by looking at photo 79. They were quite small trees when planted, and what you see is the work of only three years. These, also, came with the leaders cut out and heads started not more than 4 feet high. (You see they already shut off all view.) By glancing at photo 80, you can learn how these were pruned. A ladder was stood up *straight* beside the tree and held firmly while the operator took out the tops. Then the side branches were taken away and the wounds carefully painted. Photo 81 presents to you a fine row of these rapid-growing trees, but they are close by a drain, to which they are destructive. Photo 82 shows you how they will get between the joints of tiles and grow and flatten out there, and photo 83 exhibits the fine roots as pulled out after two years' growth. They will not only obstruct drainage. but completely fill the

Photo 74.

Photo 75.

tile. None of the poplars are long-lived. The "Lombards" are pretty, but soon get ragged or dead tops, as shown in photo 84.

You frequently run across one-sided trees, which, to the average person, would be a puzzle as to how to prune them. Photo 85 shows you one of them, and 86 teaches how it has been doctored. Notice *all* the lower branches are taken off and *all* but the small one in the upper part. The *head* is now formed above the eaves of the house. This tree is treated substantially like that in photo 87 should be. One grew out of shape by the force of the wind; the other by having a larger tree close by. In photo 87 all comes off to the left of the vertical line, and all under the cross line. This leads us to consider the matter of too close planting. Photo 88 gives you an excellent example. This is a row of fine rock maples. The heads were started at a fairly good height, but they were set less than 20 feet apart. Planted close, their branches interlocked, and if a hurricane comes that way it is apt to *plow its way clear through them*, which is what happened with these. A mild cyclone came along and tore the top of the seventh tree clear off and threw it upon the house, and took the greater part of the one on both sides, as shown in photo 89. In the path of the same storm were *single* trees that *bent*, and *twisted*, and *swayed* every way and were not hurt in the least. How grand is a tree that stands out bold and symmetrical and clear from all others! Why do people persist in planting *so many trees?* Why not have *less* of them and perfect ones?

Photo 76.

TO SUM UP ALL,

you have this, namely: First, *plant small trees;* and second, *plant far enough apart;* third, *form the tops high.*

There is a pruning implement that is not generally known, or its value is not appreciated. It is shown in photo 93. It is *Waler's Improved Pruner*. Of all the implements used in preserving the form of

Photo 77.

shade trees, nothing is so serviceable as this simple, but effective little tool. It should be placed on the market by the hundreds of thousands.

As I have said, the tendency of our best shade trees is for their lower branches to droop and obstruct view or interfere with passage. When you have once *formed the head* the desired height, then, with this pruner, you clip off the ends that would otherwise droop and be in the way. This implement has a double leverage, one at the upper end, as you see in photo 93, which shows the blade and a strong steel wire running down a light but strong staff. This handle, or staff, is made 10, 12, 14 and 16 feet long. Photo 91 presents the leverage at the lower end of the staff. With this pruner you can easily cut a branch 1 inch in diameter. Photo 92 gives you a view of a gentleman putting one of these tools to a good use. This is Mr. Minich, editor of the Kent *Bulletin*. He is a great lover of nature and almost a worshipper of fine trees. I have taken pains to speak of the *editors* because, on account of their publishing things at times, which in the opinion of all is not prudent, they have a great amount of abuse heaped upon them, and scarcely any credit given for the almost infinite good they do. The *press* is the power of the age. The man who drives the quill is shaping the destiny of the nation! It is largely within the power of the *press* to remedy this dire calamity that has befallen our fruit and shade trees. Write for the papers, present your views, argue your case, and don't forget to pay your subscription.

There is another pruner that should be brought into general use. It is shown in photo 94. This is the kind that is used in England. It is, in reality, a large chisel with a hook welded on it. The hook, also, has a sharp edge. In England hundreds of years have taught the lessons of forming the heads of the apple tree *up out of the way*. The trees are pruned, commonly, once in two years. That being the case, this pruner is about all the tool that is needed. These pruners are made of various sizes and each one has a staff (commonly of ash), and it may be anywhere from 10 to 16 feet in length. With the pruner goes a heavy mallet. You place the chisel up under at the shoulder; a few sharp taps on the lower end of the staff and the branch is off. With the hook you pull it down. A

Photo 78.

Photo 79.

quick shove with the hands will usually take off a branch an inch thick. Water-sprouts are removed by this with great speed. You can strike *upward* with the chisel or *downward* with the hook. If the factories do not put these on the market, get your smith to forge one. In apple trees that are properly cared for there is scarcely anything to be removed but small branches that cross or interfere. Always preserve the "fruit spurs." Some of the finest fruit grows *under* the foliage. Look at photo 95. It is certain that it was not Baalam's ass that performed that trimming, but it would be interesting to get the measurement of the ears of the "tree-butcher" who cut off all the *fruit spurs*, resulting in that growth of water-sprouts.

Fruit or shade trees may have their heads entirely changed when they are young if there be a good, strong leader. Photo 96 is an example of how it can be done. This tree had the top formed too low, and would have shut off all view in a certain direction from a door and a window. Three-fourths of the branches have been removed. The trunk can now be straightened. This can be done by running a sharp knife down through the bark in the *inside* of the crooked portions. This releases the tension and in time will draw the stem upright. One of the crookedest (young) trees that I ever saw is now perfectly straight. Cherry trees have a very tough bark, and it is well to run the knife clear down from the head to the base, two or three places, every year. When they are in bloom is a good time. It will be helpful to the pear also.

Photo 80.

But little pruning is needed on the plum, cherry, peach and pear, more than keeping out the interfering branches and directing the growth of the top. By "directing the growth" I mean it is within your power to form the head of a tree almost any way you desire. I will suppose you are standing looking at young trees, and at your left there is a gap or open space in the top. You desire to fill that out. You select a good branch close to this opening, and then

Photo 81.

choose a bud *on the side* toward that opening. You cut, say, about an eighth of an inch above that bud with a slanting, draw cut. You will be surprised to see how such an opening will fill in.

NOW FOR PLANTING.

Before you can prune or train a tree you must have one, and before planting we should know something about the soil. The grape vine, raspberries, blackberries and some strawberries do well in light, porous soil. The apple grows well on light soil, but is apt to throw its fruit in hot weather for the want of moisture. The apple will do well on rich, gravely land with a firm sub-soil, but the best fruit often comes from trees planted in a good clay loam, but it must be well drained. The peach, plum and cherry will generally thrive where the apple will. The pear, however, *must have clay*. This is demonstrated by the object lessons that you get up in Wood and Fulton Counties, Ohio, and away down the western part of the state. In Mercer, Darke, Miami, Preble, Montgomery and other counties where the land is level, with dense clay subsoils, the pear does well, but apples are stunted and sickly and some places look like a lot of old stub brooms. Photo 97 shows one of the *best* grown on this low, wet, heavy clay soil. Any place, however, in those counties, if you come to a knoll or little hill, you will find the apple trees having the vigorous, healthy appearance as seen in photo 98. It is useless to waste money and fool time away trying to grow apples in those level, clay counties, unless you select some elevated place or specially prepare the orchard on the level portions. The preparations would consist in plowing, sub-soiling, manuring well, and then "back-furrow," setting the trees on the highest part. Where the "dead-furrows" come, put in underdrains, using 3 or 4 inch tile. (The socket tile is the best.) Of course, to drain

Photo 82.

Photo 83.

Photo 84.

Photo 85.

Photo 86.

well, you must have a good outlet. I am convinced that a great mistake has been made in planting *too many* trees. If the average farmer would plant *ten trees* instead of one hundred, taking care to set the *small tree*, guard it well, form the top in the proper place, prune judiciously, etc., he would get *ten times* more cash than he does from the plant-anywhere, neglect-and-starve, saw-hew-wound-and-slaughter style that now prevails.

It is not my intention to give particular instructions on the management of the dwarf, ornamental fruit trees; how to form the "pyramidals," "cordons," "espaliers," etc., as there is not one in a thousand would adopt those forms; but the preparation for these and mode of planting is the same as for the "standards." If you are going to plant an orchard, take *time* to prepare the soil. You should take at least *two years* in manuring, plowing and sub-soiling. On this preparation the health of your trees will largely depend. The plowing and sub-soiling should not be less than 18 inches deep. Considerable lime and ashes should be worked in. Supposing you are ready to plant and your stock has arrived, now proceed. Measure off, place a stake where each plant is going to be set. Examine the roots of your plants. If there are any *broken roots* prune as shown in photo 99. Make a draw-cut *from under*. Roots are just as susceptible of injury as the branches. If you cut the roots from *under* the wound will heal. If you make a downward cut from above, or a side cut, the water soaks down on it and causes decay. It matters not whether it be your little toe or little finger that is injured, the *whole body* suffers in proportion to the wound. Plants suffer in like manner. Now dig out the hole, say, 4 feet in diameter (I am supposing you have *small* trees) and 18 inches deep. Scatter in about 2 inches of fine surface soil. Proceed by setting the plant. Have someone to hold it upright. Spread out the roots in *all* directions. Fill in the hole up to within 2 inches of top with good soil. Now pour in one or two pails of water; pass on and set another tree, etc. When the water has soaked away fill up around the tree and step on it lightly to make the earth firm. By using water freely you embed every little fibre and close all air chambers. You should use the tile (as shown in photo 100) as a tree guard. (This is an apple tree and the top should be formed *up* where the hand is pointing.) If you use a stake, set it *outside* the tile. Put a piece of old carpet or cloth between the stake and tree to prevent chafing; and *don't fail* to keep some bit of cloth around the tree at the upper end of the tile. If you use a 4-inch tile it will entirely prevent mice and rabbits from girdling the tree. When your tree is filling up the tile, a few taps with the hammer and your guard is out of the way.

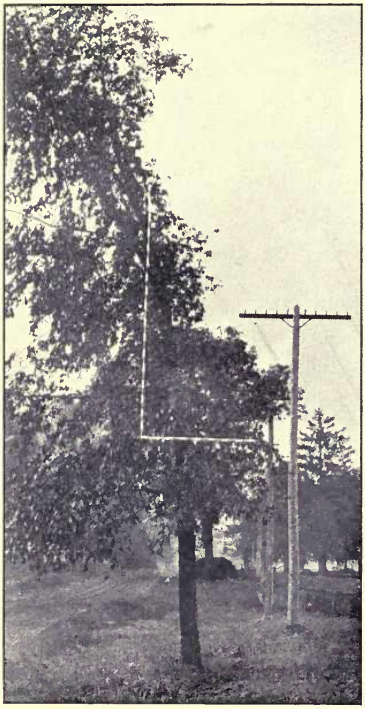

Photo 87.

Photo 88.

This guard not only prevents the mice and other vermin from destroying young trees, but prevents the terrible havoc from plows, drags, whiffletrees, etc., by thoughtless teamsters. These instructions apply to the planting of *all* trees, but it is supposed you have selected some favorable situation for your orchard.

LOW LANDS

are not favorable places for fruit trees. On average hillsides, the higher the better. Peaches should not be planted on land sloping to the east or south. In 1885 the weather became warm in the latter part of February. By the 11th of March peaches were in full bloom. By the 22nd of March the mercury stood 8 below zero. The blossoms were not only killed, but the bark of the trees ripped open. This happened in the upper part of Central Ohio. While there may be some modifications in the various parts of so large a country as the United States, yet it is well to plant with a view of holding the buds back in the spring. In the regions of the great lakes the low temperature of the water will affect the temperature for miles inland, and planting on low lands has been a partial success.

Take this as a general guide, viz.: Set cherries on land sloping to the east or south; plums and peaches on the hillside sloping to the west or north, or on a hilltop. To make sure of success with the pear, plant it on land slanting toward the north. Apples are comparatively safe in any of the foregoing situations, but cannot be relied upon, as before stated, in low, cold or wet lands. On sandy or gravely soil it will pay you well to help your trees to get a start. To accomplish this, dig a hole 6 feet in diameter and 3 feet deep. Procure a lot of sod and pitch it into the hole and tramp it down, about half filling it (there is no better plant food than rotted sods), then plant the tree as before directed. Of course, in rich, deep soils, this is not necessary. Those owning property on low lands can hold their trees back in spring if they will keep everything scraped away till the earth has frozen 6 inches or more. Then cover up with ashes, sawdust, coarse manure or anything that will hold the frost.

Photo 89.

must have particular attention. I have just said that it should be planted on a northern slope. In digging a hole for the pear go 6 feet deep, and fill up about 4 feet with sods and clay loam from the roadside or pasture lot; finish planting as with other trees. "*Six feet deep!*" you exclaim. Well, that is what I said, and just what I mean, when you plant on sand or gravel. The pear is like the rose, it *must have clay.* Also, it must have *depth* of soil. When your young pear tree arrives, look at its roots; you will observe

Photo 90.

Photo 91.

that they run *down*, and that is where you must put their food. "I'll never dig over 2 feet deep," said one, and he didn't; but seven years afterwards he had the trouble of *digging* them all out. *Nature* is kind, but she can be just as stubborn as you can. She is never known to *shirk*, but she will not do *your part.* If you dig deep in clay soil you must provide an outlet for the superabundance of water in a wet time, for some clay will hold water like a pitcher. This dead water will destroy the feeding rootlets. This is one reason why sub-soiling is recommended for orchards; it not only provides moisture for the plant in dry weather, but it carries off all surplus water. This leads us into the consideration of *blight.*

Photo 92.

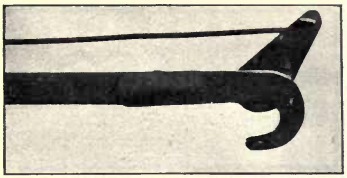

Photo 93.

BLIGHT.

Blight is not in itself a *disease*, as people are in the habit of supposing. Many eminent authorities have erred concerning this. They have taken the microscope and discovered countless numbers of spores, fungoids and infinitesimal insects feeding on the dead foliage of the plant, and they seem to have hastily drawn the conclusion that these creatures have killed the plant.

The microscope does not mislead us; there are the spores and insects on the *dead leaf*. Aye! Aye! But *what killed the leaf?* Was it the creatures that you behold? or was it something else? It was not these creatures; they had not the power to kill a *healthy* plant. *Health* defies all disease! Medical science, I think, now claims that there is no such thing as *a new disease*; that the germs of disease are all the while in existence. But if conditions become favorable any malady may make its appearance. Everything feeds on *death*. Maggots feed on putrid carcases; toadstools and other fungoid substances exist on rotten vegetation; *we* derive our nourishment from dead animals, dead vegetables and dead grain and fruit. Plants and trees are nourished by composts from other vegetation, etc., and the creatures seen on the blighted (dead) leaf of a plant have the same legitimate right to sustain their lives as we have. Again I ask,

WHAT KILLED THE LEAF?

The answer is one of the simplest, namely: *Too much* or *not enough water*. On page 15 we call your attention to the birth of the mammoth elm. What was true of that little seed is true of all seeds that develop into a plant or tree. Soak a grain of wheat or corn, then cut it open and study it; or, better still, soak an acorn. When the shell begins to crack, open it up. There are two lobes called the cotyledons (seed leaves). In them is stored up food enough to nourish this little, unborn baby oak. At the bottom of these lobes is attached a lump, somewhat hard; this is called the "radicle." In the center of this is a little point called the "plumule." Moisture and heat act upon this seed and it becomes excited into life. The radicle goes *down* and throws out very minute, hair-like rootlets. At the same time the plumule moves upward and carries the seed-leaves out to the air. The plumule in the seed is really the

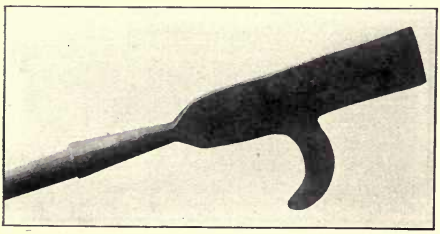

Photo 94.

Photo 95.

terminal bud. As this elongates it becomes the stem or trunk of the tree. From this simple, but wonderful zero point the work of plant and tree building commences Just in proportion to the *activity* of the roots, so is the growth of the top; it could not be otherwise. The little, wee, microscopic rootlets are away down out of sight, multiplying and faithfully gathering moisture and sending it up to the other extremities. As the plumule shoots up it forms buds at the sides; these in time become branches. Out of these limbs come other branches; from these, smaller ones. At the ends of all are what we call the twigs, on which is borne the *leaves*. If you want *to understand blight* you must always keep this fact in mind, namely: The little *microscopic rootlets* and the *leaves always work reciprocally*. Let me use an illustration. We hear the hum and clatter of thousands of machines; we see the "iron horses" darting hither and thither; the electric cars, like a lot of bumblebees, flying here and there; gigantic steamers plowing the lakes and oceans, etc. Whence comes all the motive power? *From the sun*. He has stored up *heat* in the bowels of the earth in the form of *coal*. But the *direct agents* who move the machines on the surface are the *miners*. Suppose you withhold water from the miners; they *famish* and *die*. Suppose you fill the mines with water and *drown* the miners, the result is the same, it is *death* in either case. That means *stagnation* or even *death* to commerce.

Photo 96.

It is just so with your trees and plants. These delicate, but faithful little fibres gather up the moisture and the *leaves* show a corresponding activity. The leaves are real, *commercial workers*. The leaf receives the sap as it is brought up by capillary attraction. Oh, wonderful laboratory of nature is the *leaf!* It takes the crude sap, spreads it out to the sun's rays, which decomposes the carbonic acid, and the leaf throws off the oxygen for the good of man and beast. *Cambium* is formed and is returned *down*, layer upon layer, thus constructing countless millions of trees whose timber is used in commerce, and whose fruits sustain animal and human life. Trees thus keep up activity in the commercial world, and thereby prevent war. The leaves of the trees are, to a large extent, the factories in which *oxygen* is manufactured, without which the human and animal creation could not exist. Literally it is true that "*the leaves of the trees* are for the healing of the nations." Wonderful is the leaf, and much has been written concerning it; but how comparatively little has been said about that faithful little *miner* or *rootlet*, that is away down there in the dirt and mud,

Photo 97.

Photo 98.

spending all its energies to support the modest or gorgeous *leaf* that we so much adore, and over which we mourn when we say it is *blighted.*

THE ORIGIN OF BLIGHT

is in the *destruction* of the smallest rootlets. They are very susceptible to injury. They will *drown* or *die of thirst.* Celery, and potatoes, etc., will blight in prolonged wet spells. They will blight, also, from drought. In one case the rootlets *drown,* in the other they work as long as they can find moisture, then die of *exhaustion—dry up.* What follows? The *leaves droop* and die. Then those *dead* leaves become the feeding ground for the fungoids, insects, etc., which we say is blight.

Photo 101 exhibits to you a case of potato blight. The one to the left was blighted, that to the right was not. These are the same variety of potato, same quality of seed, and planted the same day, June 15, 1901, and cultivated all alike. Crop all did well till the middle of August. The main part of the field was of rather a stiff clay, and below an average quality of fertility. The faithful plants pumped out *all* the moisture, then, of course, the leaves wilted. The drought continued day after day, and one by one the leaves fell off. What else could take place? At one end of the patch there had been some vegetable pits the fall before. The pits were some 2 feet deep. They were filled in the spring and worked over like the remainder of the field. The potatoes did not blight

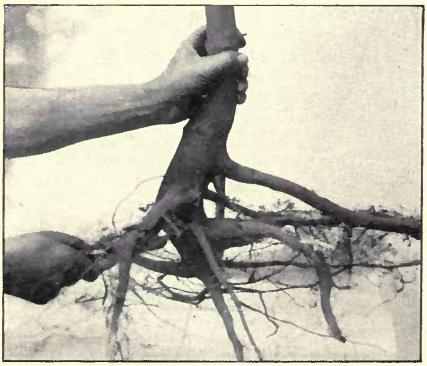

Photo 99.

Photo 100.

Photo 101.

over these pits. Why? Because the roots went *down* and found moisture among the bits of leaves and straw that had been plowed under. They stood there in perfect health for six weeks after the main crop had been dried up. See the difference in the crop of tubers! The sample that you see at the right were dug after a sharp frost, about the 8th of October. Good *drainage*, a plenty of fertilizer, *deep* plowing and frequent cultivating is the remedy for potato blight, so-called. What is called blight in trees comes from the same source, i. e., the destruction of the *feeding* rootlets.

Photo 102.

PEACH YELLOWS

seems to puzzle some of our ablest writers. The peach is tenacious to life, and does not *throw* its leaf like the potato, but the leaves, not having sufficient moisture, partially dry, turn yellow and drop prematurely. Of course, you find fungoids and microscopic insects on the leaves, because you have prepared the conditions for them. I know of a large peach orchard planted twelve years ago. It was situated on a high altitude, and in every way favorable to that fruit. But the proprietor seems to have thought that if he purchased the trees and stuck them into the ground the Almighty would attend to the rest. That is not His way of doing business. God never helps any but those who "help themselves." If you want peaches, potatoes, or anything else, you must "co-operate." This would-be peach grower allowed his orchard to grow up to grass, briers, etc. This absorbed all the moisture; none could get to the roots of the trees, and, sure enough, the whole orchard became struck with blight (peach yellows). Some who are thus afflicted (?) become almost blasphemous and charge the blame to Providence.

Photo 103.

Dr. H. M. Ladd, of Cleveland, Ohio, has a large poultry farm at Kent, Ohio (Crescent Farm). They raise the highest breeds of fowls. Mr. E. T. Blood is the manager. They have selected the finest kinds of fruit trees for the pens. In 1895 they planted apples, peaches and plums. In the following year a larger number of the same species, and also pears were added. They have experimented. All trees had the ground prepared and the trees were carefully set. Hen manure has been applied freely to some, and soil kept worked, thus furnishing both a stimulent and moisture. Photo 102 is one of the peach trees. It is so healthy that the bark shines. As you will see, the picture was taken before the leaves had developed, just when the blossoms had expanded.

Photo 104.

Photo 103 is a cherry tree planted in the fall of 1896. These examples show what good planting and constant attendance will do. Photo 104 shows you late Crawford peaches in the lady's right hand, grown under *right conditions*, and in her left is the same kind grown under an unfavorable state of things. Photo 105 presents to you a stem of the Champion peach rightly cared for.

I would suggest this: *Take time*, prepare for the trees rightly, even though you do not plant so many. If you do not prepare the soil aright and plant as you ought, your trees will be only a mockery to you.

THE PEAR BLIGHT

has been the greatest mystery. On account of the peculiar constitutional makeup to the tree, it has been hard to comprehend the cause of the dead branches. It is well known that in stepping around on the branches and loosening the bark, when gathering the fruit in hot weather, will kill the leaves on such a branch. Also, a heavy freeze in late spring, or excessively hot weather in the summer months, have both the same effect. On the night of the 16th and 17th of May, 1895, there was a very heavy freeze—a regular hoar frost. Water in a washtub froze 2 inches thick. Marrowfat peas 4 feet high were cut so that they lopped over. Two days before this I had pruned six pear trees; they were in full leaf and bloom—a beautiful sight! Two days after the frost five-sixths of the leaves were almost black. What had taken place? Just this, viz.: The *freeze* had ruptured the little cells that were conveying the sap, just as a tumbler full of water would be rent by the same force. This took place not only in the leaves, but in the twigs and smaller branches. *Circulation* stopped. There were no *leaves* now to throw off the surplus moisture. The pumps had stopped, the *miners* (rootlets) *drowned!* Commerce above (the work of the leaves) had suspended. No *cambium* was returned to construct the roots. *Death* by the tens of thousands occurred to those wonderful subterranean workers. Those trees stood there in a state of stagnation for a whole year before they could adjust themselves to this terrible shock. They were on a gentle slope toward the south. Had the same trees been on a northern slope the leaves might not have been expanded and the whole tree would have been in a more sluggish state, and would not have suffered so much, and probably scarcely any.

Photo 105.

SUMMER BLIGHT

is caused from the opposite extreme—*excessive heat.* A pear tree would never blight in the heat of summer if it had all the moisture it could use. The stunted geranium in photo 159 has suffered from exactly the same cause that kills your pear branches—lack

of moisture. You have a garden ; it is a sandy loam ; you keep it clean and manure heavily; everything flourishes, fruit trees and all. I will suppose your pear trees are seven years old or more. You are delighted as you look at their symmetrical tops and vigorous foliage. Did you ever think how much moisture is thrown off by the foliage of one of these trees from sunrise to sunset? And have you made provisions to supply the water? Probably you have not. Some day the mercury will run up to nearly a hundred in the shade. Then could the thousands of little working fibres but speak ! How they would cry out, "Water ! Water !" They are not supplied; alas, they perish ! There are always some branches more favorably situated than others; the sap flows more easily into these, while others get little or none. The latter dry up and wither; the leaves turn almost black, and we exclaim, "It is blighted !" As has already been remarked, stepping on a branch in hot weather will sometimes produce this same effect. In this case you rupture the bark and stop the circulation, which, of course, is followed by death to the foliage.

It is commonly supposed that blight in a pear tree is contagious. It is not directly, but in an indirect sense it is, but not any more than in other trees. *Dead branches* or *dead stubs* on any tree contribute of their dead, watery substance to the living circulation, and is equivalent to *blood poisoning* in the human system, and, therefore, should be removed as soon as discovered.

You can now understand why I contend that the pear must have a great depth of soil. I have asserted that the pear must have clay. This is not so much on account of the substances in the clay that enter into plant food, as it is that clay retains the moisture so much better than light soils. My opinion is that if the method of subterranean watering, which is suggested for use in the city of Cleveland, were used (see photo 115) there would be but little or no summer blight in the pear. Blight from late spring freezing is not entirely under our control.

But very little is ever heard of pear blight in England. If that country is not "the home of the pear," it is a natural climate for it. Never having the late spring freezes nor the excessive summer heat, no destruction of leaf or rootlet is accomplished from those sources. The southern and middle portions of the United States will never be entirely free from pear blight, but it is possible to obviate nine-tenths or more of it by the judicious selection of location and the provision for water in the very hot, trying days, especially when the tree is laden with fruit.

The Tyson pear seldom ever blights, because its roots correspond directly to the branches. The latter have a straight *upward* growth; the former plunge nearly *straight down*, and if any tree will find moisture the Tyson will. The *Bartlett* blights quite easily, but we can take you to a place where a large Bartlett stands and bears regularly every year and has never blighted. The whole trunk of the tree and the ground in which it stands is shaded after noon. The soil is thus kept cool and considerable moisture retained. Young pear trees do not blight from the heat of summer because, being small and newly planted, they find all the moisture needed.

Suppose you apply the Golden Rule to the pear tree. Suppose *you* were the pear tree, and you had stood there year after year faithfully guarding your precious treasures (the buds) in the storms of winter. In spring you develop your leaf and flower bud, and go on through the heat of summer. Now comes a real hot day. You call on all your faithful helpers below to send up "more water !" They work till they are exhausted. You now withhold your support from the weaker branches and try to save the best. You succeed in saving some. Then the owner comes along and exclaims, "Look at that miserable tree ! I have a notion to take an ax and cut it down." Between your sobs I think I hear something as follows: "Sir, we have wrought to the best of our ability; thousands of my assistants have died of thirst. Had you supplied us with water this calamity would not have happened."

Whatsoever you would that men should do for you, *if you were a pear tree, do ye even so for the tree.*

Calamity of the City of Cleveland.

"The Forest City." This is what the lovely city of Cleveland is called, and they have not a tree in it worthy the name; at any rate, not within a mile of the Square. Clevelanders sorely regret this and have labored hard to procure the desired shade. Defeat has met them on every hand, and it seems that the causes of their failure have baffled their wisest heads. "Why can't we grow decent trees on the Public Square?" has been asked by thousands of Cleveland's best citizens. One says the failure is caused by *gas leakage*, another assigns it to *electric currents*, a third attributes it to *smoke*, another *this*, another *that*. Good citizens of Cleveland, there is just *one* cause of all your failures with shade trees. There are some other minor matters that work adversely to your trees in some parts of the city, which I will presently explain. The *one* cause of your trouble is not due to electric currents, nor smoke, nor any other atmospheric condition. Were that the case, it would affect your flowerbeds and other plants. You will recognize a portion of the southeast corner of your Public Square as shown in photo 107. In no part of the United States is there a healthier or handsomer lot of plants grown than around your soldiers' and sailors' monument. This is true, also, in your

Photo 106.

Photo 107.

Photo 108.

public parks, an effectual and an abiding testimony to the skill of Mr. M. H. Horvath, the superintendent. This gentleman is one of the *best read* and *best drilled* floral and landscape professors that I have ever met in Europe or this country.

"Well, what is the *cause* of the trouble," you ask. Look at the leafless elm tree in photo 106. This photo and No. 107 were taken on September 6, 1901, about two hours before the fiendish coward fired the deadly shot at our beloved President McKinley. These two photos preserve the mementoes of love and respect which, in the decorations, Clevelanders manifested toward the Grand Army of the Republic, which they were preparing to receive and to which the President was to attend. Now look at that elm in photo 106. What's the matter with it? Is it blighted? Yes, *it is*, if that is the term you wish to use (see blight, pages 44-49). It is blighted so badly that all its foliage has dropped, even before the maples had put on their autumn tints. What has happened is this: Every *delicate, succulent little fibre* that gathered moisture has become exhausted and *died of thirst.* What shall I say? "Shame!" No, because you knew not what you were doing. Photo 108 shows you what they were doing on the Square on November 9th.

Photo 109.

They were digging holes 6 feet deep and 5 feet in diameter. (The trees planted there are healthy, but not of good form. They will do well for a few years, but cannot make *large* ones.) From these holes were taken the purest and *barrenest sand.* Do you expect to grow a majestic elm or a gorgeous maple in such material? If you do you will wait till Doom's Day and a million

Photo 110.

Photo 111.

years after and *then fail*. This *sand* will not retain enough moisture for large trees, besides it has been affected by deep drains, conduits, etc. The remedy is, *pull out every tree you have there and excavate 4 feet deep*, and run this barren rubbish down on the lake front and then fill in with a good *clay loam*. Dispense with sod and cover with 3 or 4 inches of gravel. Do this and then you can grow the elm or maple with top from 50 to 75 feet in diameter. "What!" you exclaim, "would you recommend such a *radical move*, involving such an *enormous expense?*" I would. You have spent enough to accomplish this ten times over and have nothing but objects of vexation. But I am sure you will not take such a rash step until you have some assurance that this would be a remedy. It is well to take cautious steps. Hence, I make you the following proposition, namely: If your park officials will *do just as I tell them*, I will plant *eight small elms* on that part of your Square shown in photo 109. These elms will in time completely cover that entire plat. I would form their heads *not less* than 15 feet high, so as not to obstruct any view. The heads of the trees that you have now are all too low. Look at those scrawny excuses for *trees* in front of the Forest City House. The tops should be *up high*, but the branches are so low that they (together with the scrubby underbrush called shrubs, a rendezvous for that wonderful songster, the English sparrow) cut off all view across the Square. I will plant and care for said elms for ten years, and neither trees nor my individual labor shall cost your city one cent. As your whole city is built on sand, your city officials ought to have "sand" enough to take up my proposition and have the test made.

You can never get a *fairly good shade tree on your streets that are paved* unless you plant in another situation. Photo 111 is a portion of Euclid Place. There is a row

Photo 112.

Photo 113.

of sickly, bark-peeled, scrubby maples planted down the street that you see. All pains have been taken to make a success with them. But, in the first place, the trees were too large when planted, producing *dead* centers (see page 31), and second, they never can amount to anything there, because, in addition to having nothing but pure sand to root in, the street is *paved* and thereby shuts off all rainwater from penetrating. Though they have provisions for watering and have iron tree guards, yet there they will stand year after year, *trying* to thrive, but will be nothing but scabby, diseased objects, which finally will be torn off by the wind or otherwise perish.

The place for shade trees on such *paved streets* is *inside the fence, on the lawn*, as shown in photo 113. Trees properly planted, say, 3 feet from the walk, *inside*, would in a few years cover the sidewalk and ultimately go to the middle of the street. You frequently see this where the soil is good. Photo 114 shows you a row of maples planted *inside the fence*, whose branches extend to the middle of a 60-foot road. This is west of the beautiful little city of Ravenna, Ohio. To prove to you

Photo 114.

Photo 115.

what I say, I call your attention again to photo 111. The first tree is in front of Mr. F. H. Clark's. This gentleman is a member of the Eclipse Electrotype Engraving Company, of Cleveland, who executed the engraving of this work. Mr. Clark almost adores a fine tree. He ordered the trees which you see in front, and, of course, put the *best* there; he had one left and stuck it in the back yard. Photo 110 is the one. Look at its robust habit, and mark the heavy foliage in contrast with ones in front that have lost nearly all their leaves. What is the cause of the difference? Just this, namely: Those in front are root-bound, and have not been able to procure a sufficient supply of water. Mr. Gorgeous in the back yard has had no restraint on his roots; he has been rambling all around the dooryard and *quietly* (*don't tell anyone!*) has crept under the fence into the neighbor's garden and yard, and is on the right course to compare favorably some day with that handsome tree on page 21 You Clevelanders can secure fine trees if you will take the right steps. You should entirely abandon the attempts to grow in the *narrow borders* between the *paved* street and sidewalk, and set the tree about 3 feet in from the walk. For each tree excavate 3 feet deep and 6 feet in diameter. Fill in the bottom 1 foot high with sods of a clayey nature to retain the moisture. Tramp down the sods well. Then use the device shown in photo 115 for subterranean watering. This consists of four "T" 3-inch tiles, one placed in the other, as you will see, from one of which other tiles run, through which the water is conveyed to the *square*. The *ends* of these tiles composing the *square* are closed with cement, also each joint is cemented at the bottom and half way up the sides. This forces the water all around and it comes out at the upper side at each joint. Set a *small* tree and cover with *good* soil as directed on page 41. As a tree grows, circles of these tiles can be placed in the ground 2 feet deep. The

Photo 116.

Photo 117.

Photo 118.

first circle should be, say, 6 feet (radius) from the tree, the next 10, etc. By this subterranean method of watering you can grow very fine trees in the city of Cleveland, though they never will be as large as in localities where *all* the soil is adapted to hold moisture and furnish the necessary food for the plant. It is safe to say that you can in this way produce healthy elms, maples or even oaks that would form heads from 30 to 50 feet in diameter. Where the tree is exposed, use the *German Tree Guard*, as shown in photo 116. This was taken in front of Mr. Paul E. Werner's, Akron, Ohio. Almost every child has heard of Paul E. Werner, to whose energy and tact Akron is indebted for the largest printing establishment in the world. If Mr. Werner does not worship at *nature's* shrine *he sings her praises.* He has had great trouble in starting trees (*paved streets* again, you see), and he introduced this commendable *tree guard* from Germany, where, he says, he saw them in every city. The danger in planting trees in yards is, that thoughtless people run the lawn mower against them, which ruins the tree. A specimen of this is seen in photo 117. The remedy is a simple one, namely: Cut the sod away from the tree to the distance of a foot, as shown in photo 118. Keep this hoed to prevent weeds starting. It is beneficial every way, as the rain soaks in and helps the plant. You plant too thick in Cleveland and form the tops too low. Plant 30 feet apart. The row of trees down by the lake front are among your highest, but they cut off the view of the lake. (See photo 112.)

Very sensible tree guards made of wire have lately appeared to keep horses from gnawing trees. It is astounding how thoughtless people are in such matters. Look at photo 119. This is the result of horses gnawing the tree when hitched to it. If you have a tree in front be *sure* that you have also a hitching-post.

Well, good people of Cleveland, the blame is not to be attributed to you for having failed to produce good trees, for you have *tried hard* and failed, when others have done *nothing* and succeeded. It is unfortunate that all the main part of your city is built on the most sterile soil and barren sand. As you go east a few miles (Gordon Park for example) the soil changes and vegetation improves. Going west, also, the betterment takes place. At West Madison Avenue the surface is underlaid with

Photo 119.

about 2 feet of clay sub-soil, and though there is the barrenest sand under the clay, yet the trees look fairly well.

The State House grounds at Columbus have but little better trees than the Square at Cleveland. What the soil is in Columbus I have not had a chance to examine, but Ohio ("The land of the beautiful") should have trees around the State House worthy of such a productive and magnificent state. They can have them in Columbus if they *will.*

Planting trees between the sidewalk and *paved* streets should be abandoned for two reasons. First, there would be no interfering with telephone, telegraph and electric wires. Second, in planting *inside* the sidewalk, and forming the tops high, the walks would be completely shaded.

In order for the people of Cleveland to understand the trouble with their trees, they should study carefully what we have said on "blight." What was said there is here repeated, namely: There is no such thing as blight *as a disease*, and further, *health defies disease.* Of course, I do not mean that young trees will defy cattle, or healthy potatoes repel the attacks of bugs, but it is true, according to scientific investigation, that the potato bug always attacks the *weak* plant. The scientist informs us that if the parent bug were to deposit its eggs on a healthy leaf, when they hatched and they ate through the leaf the flow of sap would be so copious that it would literally *drown* them. Hence, by natural instinct the mother bug selects the dryer leaf that her young may not be subjected to danger. Carry this thought further. Last year you were alarmed at the inroads of the oyster-shell bark-louse, a tenacious and deadly foe, on your Carolina poplars. Why did they attack the poplars of Cleveland more than any other place? I think, upon investigation, you will find that the *weak constitution* of the trees invited the attack. Suppose your trees could have made the growth of those of Dr. W. W. Osgood's, Kent, Ohio (see photo 79), in three years, would not the free flow of sap have drowned the youngsters and thus defeated the assailants? I did not see the diseased trees, but presume they must have been, like all your others, of *feeble growth.*

In photo 165, you will see a handsome lot of young elms. Pains were taken to sow the seed and raise these plants for the city of Cleveland. Our representative is authorized to present one of these plants to each person purchasing THE TREE DOCTOR (as long as they last), and instructions for cultivation goes with each tree. Remember, these were started the *first year* in the new century, and we call them "the century elm." (See photo, page 3.) A test of one thousand elms in your city will prove the truth of the assertions which I have made. You can grow good trees in Cleveland if you make the conditions right. It will take time to prepare for the planting. You should agitate for the calling of public meetings, and adopt every means that will lead to the production of shade trees which you so much need.

The trees that you now have on your Public Square can amount to but little. The northeast, northwest and southwest corners should be completely covered with fine foliage. You can get it if you will. If your officials wish to accept the eight elms proposed I will set them either next Arbor Day, or a year from that, and I will keep the plants growing, and they can take time to make ready. An universal movement should be made in our public schools concerning *trees* as the *friends of man and beast.* Would like to see Cleveland inaugurate such a laudable work.

What has been said concerning the state of things in Cleveland will apply substantially to any others afflicted in the same manner. It is hoped that Clevelanders will apply the remedy so that we will not be suspected of burlesque when we speak of "The Forest City."

Read "Inspection of Nurseries," in the back part of this work.

DEPARTMENT II. Ornamental.

No matter how grand an object may be, the eye tires of *sameness*. This is exemplified in the fact that rural people have a mania for "moving into town," and town's people long for the pure air and charming scenes of country life. Ornamental planting is not particularly desirable around town or city residences, for, as a rule, there is an *overbalancing* of the *artificial* in urban surroundings. This is one reason why, in the city, with so much *stiffness* and lack of a variety of real, living objects, people sigh for rural scenery, strive to procure fine shade trees and make "pets" of horses and other animals. The proper thing to do, is to so build and so apply the landscape art as to blend the

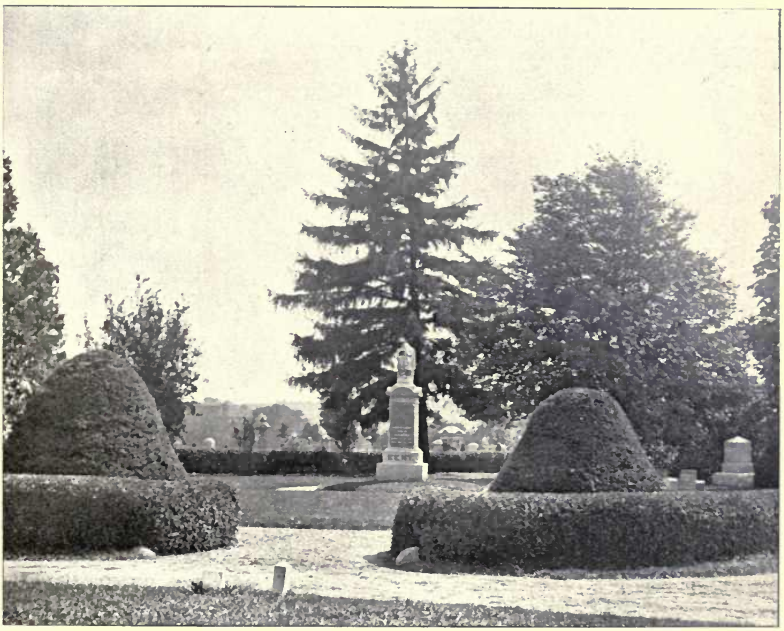

Photo 120.

natural and artificial. In cities, ornament planting should not be overdone. In rural districts it may be adopted liberally with splendid effect and an enhancement of real estate value. In England, Scotland and many other parts of the old world, the historic *yew* has been freely planted for ornamental purposes. But this is a slow-growing tree and lives to a great age. You probably have seen the photographs of many of these venerable and majestic beauties. It is well to plant the yew, but the average American does not take to the idea of setting a tree that will mature five hundred years from now. The American is the man of the "*now!*" At any rate, he does not care to wait but a few years to see the result of his labor. That being the case, we give you a few examples of *quick-growing* plants that can be used for ornamental work.

Photo 121.

In photo 120 you see the burial lot of the Hon. Marvin Kent, in Standing Rock Cemetery, Kent, Ohio. The city of Kent is named in honor of this venerable gentleman. In the rear of the lot you observe a *tall* evergreen tree. This is a Norway spruce. On either side of the entrance is a *shorn* tree; these, also, are Norway spruce and the same age as the tall one. Shearing or pruning has the tendency to *dwarf* a tree or plant. (This is why skilled gardeners prune fruit trees, and *train* them to produce *early* bearing.) These trees stood about 15 feet high in 1881. They were cut back in August of that year. The shorn arbor-vitæ hedge that you see stood 7 feet high and was cut back at the same time the trees were. Both trees and hedges are shorn in August of every year. Photos 121, 122, 123 and 124 are all taken from the beautiful Standing Rock Cemetery.

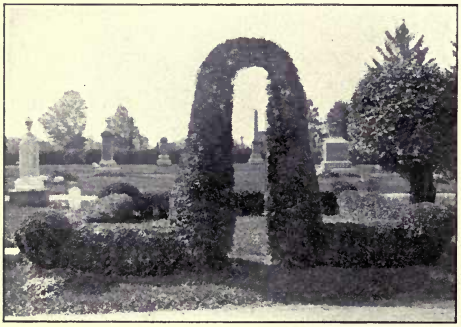

Photo 122.

The arbor-vitæ is capable of being trained into almost any form. In 121 you will notice a specimen that resembles a cross. That is what it was started for, but the training has not been good. All that was necessary to secure this form was to drive a stake having cross arms. To each of these a good, strong branch was fastened and the top cut off. Another branch was carried *up* and the top clipped out. An annual trimming has brought it into the present form. It is well for boys and girls to practice forming designs with this variety of arbor-vitæ. This is the American arbor-vitæ. The arch formed in photo 122 is the same kind. So is the hedge and the one seen in the distance, as is also the hedge in photo 120. By setting four plants, and about the third year bending down the branches, you can form a dog or other animals. A good-sized one in your front yard might do quite a little "scaring" on moonlight nights. The two pyramidal trees in photo 123 are the Siberian arbor-vitæ. The plants of a globular form at the corners in photo 124 are Hovey's golden arbor-vitæ. The tree in the midst of the lot with the two rings formed is the American blue spruce. The arbor-vitæ must not be planted under

Photo 123.

Photo 124.

Photo 125.

the shade of other trees, for they will not grow. No other tree should be planted within 20 feet of them, unless it is one that is to be shorn. Photo 125 presents to you a case of failure *under other trees*. One of the commonest mistakes with the arbor-vitæ is not keeping them *low enough*. They have frail branches and a heavy snow will *crush* them, as shown in photo 126. The hedge should be allowed to grow unrestrained for about four years. Then cut the plants off, say, 18 inches from the ground. Be careful to *form your lines right* to start with. Have an uniform plane. Don't cut the side *straight up and down*; if you do the foliage will not do well. *Round it over* as you see the hedge is in photo 120. You cannot form hedges or ornamental trees from the *pine*, *fir* or *larch*. The pine throws out a season's growth, at the termination of which are a number of buds which become *laterals* (side branches). If you cut off the leaders of the pine you can stunt or dwarf the tree, but you cannot make it *bushy*. The *spruce* is different.

Photo 126.

Photo 127.

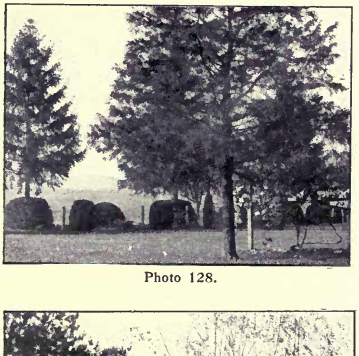

Photo 128.

Photo 129.

Photo 127 shows you the top of a young Norway spruce. The leader has been severed and placed down at the right. If you look at it you count eight or ten little knobs distributed at its sides. These are *latent buds*. If you clip the top off all these latent buds become excited into activity, and on them, also, will be the latent buds. The more you shear, the more you excite these dormant branches, Hence the Norway spruce is one of the *very best* plants for hedges. It is just as ornamental as the arbor-vitæ and possesses the great advantage of *strength*. The hedge that you see in photo 129 is of this kind, and its strength is such that you can lay a common fence board on it and walk on it with pleasure. The hedge is about 24 years old. In photo 128, to the left, you see one of these same trees. Three tiers of branches were taken out and the bottom ones were trimmed into a globular form. Up from the middle of this the main trunk is allowed to grow. There is quite a number of these in a row relieved by a variety of other designs—arbor-vitæ and others. The hedge in photo 130 is of Norway spruce. That has been started rightly, *low down*, so that it can be controlled. The plants in that hedge and the ones in 131 came *in the same box* in 1886. This shows what *dwarfing* can be done by clipping. If you were to cut down the plants in the hedge shown in photo 131, *half way*, the top would thicken, but it would never fill out well *below*. The only way to get it *thick* at the base is to *start low*, as shown in photo 130, when the plants are young. After the lower branches have been brought out, if you keep the hedge *rounded over*, you can gradually bring it higher and still maintain the density at the base of the sides.

All evergreens are partial to *high* and *dry* lands. You can do nothing with them in *low*, soggy soils. If you desire hedges in the latter, use osage orange or honey locust. Before planting a hedge, if the soil is not good, excavate to the depth of 2 feet and replace with good soil, placing sods in the bottom if you can procure them. Use small plants, not more than a foot high. Keep cultivated. Let no weeds grow. Mulch heavily with manure in the fall; remove mulch in the spring.

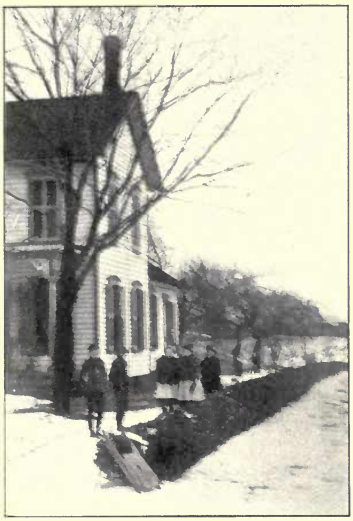

Photo 130.

It is not desirable to have a lot of evergreens around a dwelling house; the wind, whistling through them, "sounds too much like a cemetery." It would be well, however, to plant in groves to encourage as nesting places for birds.

A LAMENTABLE BLUNDER

has been made in destroying our "feathered friends." A French naturalist has set forth the fact that the human race could not exist over nine years if all our insectiverous birds were destroyed. Kind Mother Nature has varied her general plans here; she has arranged so that we might not have to wait till our enemies (the bugs) die of old age, but has given us the *birds* to "catch 'em alive." But we, foolish children, have slaughtered our best friends, the *birds*. The swallow is said to capture some 3,000 flies in a day; the chickadee is the destroyer of the eggs of the canker worm; the meadow-lark feeds on bugs, as do also the blackbird, crow and a host of other kinds. Among the friends of mankind none is more faithful than the beautiful, half-domestic quail. In 1900 a great agitation arose in Ohio, which looked like a war between sportsmen and the farmers. The real facts were, the agriculturists were struggling to have the quail placed under perpetual protection, on account of their inestimable value as destroyers of innumerable hosts of bugs and other enemies of the farmer. City people, as well as agriculturists, *must learn* the grave fact that we cannot destroy our friends without paying the penalty. The shooting of birds for *sport* has had a baneful effect. We should teach our children the great mistake of doing so. Marksmanship, however, should be taught in our public schools, to both boys and girls. It strengthens the arm muscles and gives a strong nerve, and confidence takes the place of timidity and fear. Woe the nation, then, that would assail Uncle Sam!

Photo 131.

DEPARTMENT III. Landscaping and Floriculture.

THE LANDSCAPE ART.

The Americans, as a people, are more lavish in their house-building than any other people on the face of the earth. Not only native-born Americans, but perhaps a majority of those who "come from o'er the sea" have an innate desire for that sacred something that we call "home." Indeed, this is the prime, actuating motive that leads the average foreigner to leave his native land. He dreams of a plot of land that will be *his;* of a house (possibly an humble one) that he can call his home. Aye! "Home, sweet home." How little we stop to think of the measureless effort that has been put forth in this direction, and how few of us think seriously on this *one fact*, namely: That *home-building* is one of the prime factors that enter into the vital energies of our commercial activity. Let a serious *panic* come and see what a paralysis seizes on commercial life. But I must write on economics.

I desire to raise a question here, namely: Considered from an actual financial standpoint, have we not, in some degree, *erred* in the methods of expending money? For example, you are driving along and you see a costly building, but perhaps it is out of proportion to the lot, or possibly the person who graded it was better qualified to dig ditches or drive cows to the pasture than to pose as a landscaper. Or the grading might be too stiff, as in photo 134, or the planting might be a huge blunder, beclouding the front and shutting off all views, as in photos 132 and 133. At any rate, your mental ability to blend and balance and measure and to judge of correct proportions tells you "there is something wrong." You drive a little farther and your attention becomes riveted on a small property worth, perhaps, not more than $5,000. There is the lovely green front, like a carpet, with an occasional shade tree. Shrubs are at the side, filling out the nooks and corners. The front yard has either no flower beds, or a single one, a majestic beauty, as you see in photo 142; but that is not in the *middle of the yard*; that would be too "studied"

Photo 132.

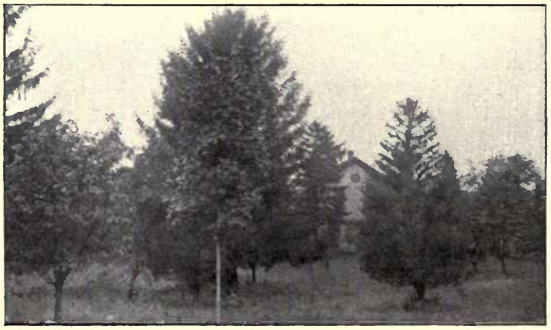

Photo 133.

Photo 134.

and stiff. The lawn is not a *flat*, dead level, but slightly rolling, as in photo 135 (a model "open lawn center," the home of Ira Herriff, the popular undertaker of Portage County, Ohio.) Look at photo 136. If you were standing on the front porch that is how you would see the lawn to your *left*. You will notice the ornamental grasses and other shrubbery are forced back to the side. This is in accord with the excellent taste of S. T. Williams, the former owner. Photo 137 presents to you a glimpse of the neat little property of Dr. W. W. Reed, of Kent, Ohio. There was almost a dead level from the sidewalk to the bottom of the third tier of underpinning, or "ashler," as it is called (the point from which the grade starts). This was very objectionable. The remedy was to excavate about 8 inches *inside* the sidewalk, gliding down from the walk to a point about 12 feet in from the walk and then gradually raising the grade up to the house. As the eye now catches the grade it runs *up* to the house, making it look elevated, though it is still on a level with the sidewalk. The real art of landscaping consists, very largely, in producing those illusions. The real landscape artist, like the poet, is born, not made. He has not an *imitative*, but a *creative* mind. No one can ever *imitate* nature, because she has no duplicates. I know a gentleman who has spent over thirty-five years in the art of landscaping and never executed two pieces of work *alike*. It cannot be done with success any more than one suit of clothes will *exactly* suit two persons. The similarity may be so near that there is no serious objections, yet *variety* is desirable, because, as we have said, the eye tires of *sameness*.

Glance again to photo 134. This is a beautiful house, highly elevated and everything in favor of bringing out the most charming results. Look at the house; *straight* lines and *angles*. Now look at the terrace; *straight*, *level* line with *angles* at the ends, as if a *level* had been used, and the whole job finished with a jack-plane. The want of *attractiveness* in this property grows entirely out of the want of *variety*. Look at the *planting*. There are *two* cut-leaved birch, *two* arbor-vitæ, *two* Irish junipers, *two* weigelias, *two* roses, etc. The job was probably "bossed" by some boy who had just been learning his "two times" table. Two hundred dollars' expenditure on the grade of that property and judicious planting would have added *two thousand* dollars to its selling value. By a conservative estimate on the *increase* of value of property by the application of the landscape art puts it somewhere from *two to ten dollars for every dollar expended*. In building, if funds are short, it is sensible and profitable to put *less* into the house and have the

Photo 135.

surroundings complete. A mansion without the landscape finish looks defective and sometimes repulsive, but a log cabin, with a nicely finished yard, everything "balanced," with neat walks and drive proportional in width to the frontage, and a judicious arrangement of trees, shrubs and flowers, brings forth spontaneously the exclamation: "*That is home!*" Many a man who grades yards knows nothing more than to rake off the surface and make it smooth, and has no idea of proportion, waves, rolls, flares, etc., and cares but little about the quality of soil used and has no understanding how to make the flower beds (which in new lawns should always be made when the work on the grounds is being executed). Perhaps these men do the *best they know how*, but the trouble is they are not *born landscapers*, but work of such importance should not be entrusted to them. Study the art *yourself;* determine what *you* want and see that your wishes are carried out. To assist you, some few "pointers" will be given.

Photo 136.

Never use a *terrace* if you can dispense with it. The main objection against the terrace is, it is *hard to take care of*. In 134 there is a double terrace and there was no need of any. The foundation of the house might just as well have been two feet lower, and as the house is back from the street some 200 feet there was an excellent chance for a graceful slope and a spacious lawn, with plenty of room (at the side), for the most gorgeous display of decorative plants. Sometimes the terrace *has to be used*. Photo 140 gives an example. That is a property which was said to be *graded* when the picture was taken, but it changed hands and the grade did not suit the new proprietor

Photo 137.

As one stepped from the porch he was in danger of rolling down the grade. That photo was taken the first week in May. The next photo (141) was taken July 5th, about nine weeks after. You can see there has been quite a transformation. A team was put to work scraping in earth to fill out the front, to make the *lawn proper* wide enough to show a contrast with the house and for the convenience of the occupants. This made a very abrupt embankment and had to be sodded, but you will notice that there are no sharp points, but the terrace *rounds up* and merges into the lawn. Had this house been built 10 or 12 feet further back, no terrace would have been needed.

Before you *lay out* the cellar be sure that the *right proportion* exists between the front grounds and the building itself. For example, if the *depth* of your house is to be 50 feet, it should be no less distance from the sidewalk to the house. A greater depth of lawn would look better.

You never can apply any landscape art to offset the awkward appearance of a big house in a small yard. It can only be excused in structures erected (in towns) for boarding houses, etc. There is a way to partially overcome the out-of-proportion front yard. Glance again at photo 140. You see a (comparatively) big house on a little hillock. Now look at the same house in photo 141. You see the heavy vines growing around the porch; mark the effect, they hide the woodwork and become, substantially, *to the eye* a part of the yard. The landscape artist understands these little points and adopts "means to the end" to produce different effects. He has to study *forms*, *sizes* and *colors* like a milliner would in fitting hats for ladies. The art is allied to floriculture, and, like bouquet-making, there are no *set rules—naturalness* is the thing to be studied. There are thousands of people who have natural taste and adaptation for this charming vocation, who never have taken the first step in the way of application. Develop yourselves; let us have more charming landscape. One of the most deplorable things is the *waste* of the best soil. Usually the house is "let" by contract. Stake out the cellar. Bring on the teams! Scoop out the soil! Cover it up with clay, gravel, sand or anything that comes in the way! Drag this over, work it down, rake it off, scatter in the grass seed, plant the trees, shrubs, flowers, etc., we'll soon have a yard. Of course, you will; you'll have a *yard* and *nothing* in it! Don't curse the seedman because the grass seed wasn't good; don't find fault with Providence because everything is dying on your hands. Make *conditions* favorable and *all* will come out right. See that every bit of soil is taken care of. Fill all depressions with stones, rubbish, sand, brick-bats, gravel, anything, in fact, that will not settle. Put on the top soil; get your grade pretty near where you want it, and then, well, don't be in a hurry! If it is the fall of the year, let your lawn lay over till spring, then work it over as soon as dry enough. You will now accomplish two things, i. e., first, you fill up all depressions, and, second, you will destroy hundreds of thousands of weeds just as they are germinating. *Early spring* sowing of

Photo 138.

grass seed is always a success. Late spring and summer sowings are not reliable; the question of their tender roots standing the torrid heat of July and August will be determined by the frequency of showers and cloudy weather. If you grade your lawn in the late spring or summer, let it lay and work it over once in two weeks. This will kill weeds and all will be "settled" by the first week in September. Then sow your seed and rake in and roll.

WHAT IS THE BEST KIND OF SEED?

Kentucky blue grass is the very best to form a *tough* sod. White clover will fill out and make your lawn like a carpet. It is no use to sow the clover except in the spring. If you sow in the summer it will *burn out.* If you sow in September it will start nicely, but most always *winter-kill.* Don't use the common *red* clover. The red and white are both shown in photo 139. The plant to the right is the coarse-growing, red variety; that to the left, the Dutch or *white clover*, specially adapted for lawns. In photo 138 to the left is a bunch of Kentucky blue grass. This multiplies by *running* in the soil and shooting up new blades, like the *lily-of-the-valley.* This in itself is pre-eminently *the best lawn grass* there is. The plant to the right is timothy. We have often used it in the summer, as it germinates easily and is a strong grower. Sowed with blue grass the timothy works all right, as the timothy will give out in a few years and the blue grass will have full sway. The lawnmower, however, must be kept at work or the timothy, being so much ranker, will crowd out the blue grass. Red top, also, is a good lawn grass, especially adapted for low, heavy soils. Make your own choice of what seed you use, but don't use the red clover; *too rank.* You may get some idea *how thick* to sow when I say your seed should lay on the ground so that (in a rough way of guessing) if averaged up, they would be from a half inch to an inch apart. The experienced landscaper, the moment he sees a yard to be converted into a lawn, has the main points right before him. The points are the bottom of the cut stone in the house as a starting point, and his *drops* to the drive, sidewalk, street, etc. Then he has to study how to carry out a gentle roll, like the brow of a hill, then to *sweep* down as if a *wave* had receded, and in a variety of ways reproduce a *natural* appearance.

Photo 139.

The landscaper is in his glory when he can branch out in parks and other public grounds. There his *creative* faculties are brought into play. The camera could be of but little use to teach the art of landscaping on public grounds. It could not take in enough to be of any particular service. I have selected a few small properties to convey the lessons on the main principles of

Photo 140.

the art, knowing that if people comprehend them, they need not have a "botched-up" job forced upon them. To succeed in landscaping one must have a general knowledge of

FLORICULTURE.

Who is there that does not love a flower—*some* flower? Well, there are such, but, thank fortune, they are but few. Imagine a world without music, birds and flowers! We would want to emigrate, would we not? The author of this work has nothing more indelibly fixed on the mind than "grandmother's flower garden." How he and his brothers and sisters used to delight to visit this paradise around the thatched cottage. What thrifty "ear-drops" (fuchsias)! How charming the roses! How fragrant the wall-flowers, sweet-williams and stocks! And how our little hearts bounded with joy when grandma gave us each a sweet bouquet, kissed us and said, "Give my love to mother and father; good-bye, come again." Who can begin to measure the elevating and purifying effects of flowers? No wonder the Great Teacher gave the world the text, "Consider the lilies, *how they grow.*" The (almost) universal love of flowers is one of

Photo 141.

the things which proves the world is growing better. Did you ever try to estimate the amount of money annually spent in the United States for flowering plants and shrubs? Add to this the immense sale of cut flowers, and it certainly runs into the millions of dollars. But what a lamentation all over the land! "I can't grow the pansy," "I can't succeed with the carnation," "I'd give anything if I could succeed with the rose," etc. It is really *sad* when we think of the multitude of people who freely spend money to beautify their homes, and then *fail*. If I can succeed in assisting such, certainly I shall not have lived in vain.

You should read every word in the article on "Blight" (see pages 44 to 49 inclusive), before you peruse these instructions. Remember, there is no such *disease* as "blight." Nothing happens to the human being, animal or *plant* without a *cause*. The normal condition of all living things is *health*. Plants will "*take cold*," "*catch disease*" or suffer from wounds like the animal creation. There can be nothing more elevating to children and youth than the study of plant life. Cold winds will blast the leaves of trees in late

Photo 142.

spring or early summer. The excessive heat of summer will wither them if they are not supplied with moisture. The pastures dry up in July and August, your roses give out, your carnations fail to do anything for you, potato vines and pear trees "blight," etc. Now what is the trouble? Are all these things diseased, or are a part of them "resting?" That is what I will try to make clear to you. The *cause* of *all* these happenings is the same, namely: the destruction of the minute fibrous roots. The *visible* fibres were once called "spongioles," but the microscope reveals workers smaller still. They are wonderfully susceptible to injury. I again suggest that you read the article on "Blight." You will find there how the various causes operate against these little laborers.

You cannot succeed with the pansy in July and August, but they are not necessarily *diseased;* they are *resting*. Read the article on the pansy.

Your carnations do not thrive in hot weather. They also are *resting*. The carnation, as you know, is much like the common garden pink. Their nature is such that they do best in a moist temperature, ranging from 50 to 70 degrees, hence they do their prin-

Photo 143.

cipal work in May. The carnation will bear a little higher temperature, but, as you know, they are not hardy.

The rose also, you are aware, does its best work the latter part of May and early part of June. Then the "perpetuals," as they are called, *rest* in the hot months of July and August. If the "perpetual" rose has proper treatment it will bloom again in September.

Photo 144.

THE HOME OF THE ROSE

or its natural climate is in England. There is no more charming sight than the *tree rose*. To produce a tree rose, a common "Hewmack" or wild rose is taken, and into this is budded any of the high-grade varieties. It is almost impossible to describe the beauty of the old Lord Raglan, Marechal Neil, Gen. Jacqueminot and other larger but more delicate tints of roses growing on veritable *trees*, a straight stock, with the head formed some four or five feet from the ground. But it seems that the eastern, northern and middle states of America are not favorable to the *tree rose*. They winter-kill. However, if pains were taken, this might be averted. You must avoid a wet, soggy place for the rose, but they must have *clay*. If you want a *real, good*, healthy, permanent rose-bed, make it four feet deep. If it be heavy clay, put in an underdrain to prevent water from lodging there and destroying the *feeders*. Fill up three feet of this with two-thirds of clay sods and one-third of heavy cow manure or night-soil.

Photo 145.

Photo 146.

Photo 147.

Photo 148.

(The best "Jack" roses I ever grew were from a bed that had three loads of night-soil mixed with the sod.) The top or last foot of soil may be from the garden, and should have no "*raw*" manure with it. Set your plants in the *early spring*. Never prune in late fall. Pruning should be performed just as the buds are beginning to push, in spring. Cut out *all* weak wood and *dead* branches and clip the tops of the remaining ones. If you made a rose-bed in the form of a trench and adopted the subterranean watering suggested on page 54, you could start your *hybrid perpetuals* the latter part of August and get them into bloom in September. To get the plants to bloom in September, they should be pruned in August. In the eastern and northern states, our hardiest roses are liable to succumb to the severity of winter. In photo 162 you have presented two methods of wintering the rose. To the right you see a mound drawn up around the

Photo 149.

base of the rose. To the left is an excellent plan exemplified. The branches are tied together and a common building tile is slipped down over them. This tile is nearly filled with sand or common earth, and a few leaves tucked in on top. No frost will kill the plants *below* this protection, and the hybrids can be wintered in this way in Northern Dakota, and in Central Ohio the most tender tea roses will winter all right. When your hybrids become large, protect them in this same way by putting nail kegs or small barrels over them. But be sure to use the *earth* or *sand*. A large quantity of leaves or straw will *smother* the plants. Syringe your plants every spring, *once a week*, when the buds begin to push, with a solution of whale-oil soap, until the leaves are fully expanded. This will keep off the slug and other pests. Let no weeds grow around the rose. Keep it cultivated. The hybrids need no water if the bed be rightly made. Beds for the teas should be made not less than two and one-half feet deep, and if the subterranean method of watering be adopted, a profusion of bloom would be secured through the whole summer. Don't try to *force* the hybrids in July and early August. All plants *need rest*. That is the time they take it. The rose will do *wonders* if it has *good co-operation*. In 1876 we planted a yearling Solfratare (climbing) rose. The third year after, a friend made an estimate of 3,000 buds on it at once. This was in a greenhouse, the bed had four feet of soil, and under that was heavy clay, into which it rooted. The front lawn is not a desirable place for a rose-bed, particularly the hybrids, as there is nothing attractive about them only when in bloom. The rose *must have sunlight*, the *more* the better. Even the tea rose will never be anything more than a *partial* success as a *pot plant* in dwelling houses (see "Pot Plants"). The magnificent "Jacks," "Brides," American Beauties," etc., that you see on the market in the winter season, are produced in "rose houses" specially constructed for that purpose.

The carnation has a comparatively small root. A good garden, with a rich soil, about a foot deep, is the best place to grow them. They are not a success as a pot plant in the *summer* season, but they do fairly well in the fall, winter and spring. Don't keep around old plants. If you cannot root "slips," procure young plants from the greenhouse every spring. A two-inch pot plant is large enough. Plant in the garden, pinch back the top a few times to make it bushy. Cultivate as you would corn or potatoes. Lift carefully in the latter end of August or the beginning of September, and place it in a 6, 7 or 8 inch pot, according to size of plant. Shade it from 10 a. m. to 3 p. m. for a week. Use a jardiniere. The carnation thus treated will give satisfaction. When the plant becomes exhausted, in spring, pitch it out and prepare others in the foregoing manner. It is well to set

PLANTS FOR CUT FLOWERS

in the vegetable garden. The geranium, feverfew, heliotrope, mignonette, sweet alyssum, candytufts, verbenas, etc., do better in the common garden soil than anywhere else, provided that such soil be "in *good heart*." Put them in a fresh place every year.

Photo 150.

FLOWER-BEDS FOR LAWNS.

Many failures in the lawn flower-bed are for the want of knowing the nature of the plant. Before you make the

Photo 151.

bed, determine *what* you are going to plant in it. Are you going to grow for *leaf* or for *flower?*

Suppose you want a canna-bed, such as is presented to you in photo 142, how would you proceed? Well, that is what you want to know. I don't know that you are prepared to duplicate it, but here is the formula: Rise at 3:30 a. m., dig for two hours, wheeling away the sand, gravel or clay, continuing every morning until you have a hole eight feet in diameter and three feet deep. Have a big two-horse wagon-load of cow manure hauled, and mix this in with *good soil.* Tramp it down so that it will not settle too much. *Round* it up eighteen inches higher than the surface. Prepare the caladium-bed the same way. Cannas and caladiums are very succulent and will stand the hot sun, but must be supplied with an abundance of water or the leaves will wither. This reacts on the root, destroying the *feeders.* (See "Blight.")

The caladium is grown entirely for the leaf. (See the two plants in the old stumps in photo 143.) Cannas, also, are grown mainly for the foliage. The new French varieties have gorgeous flowers. The coleus, as you know, is cultivated entirely for the richness of its foliage. This plant delights in a rich, light soil. The bed should not be less than two feet deep, the more fertilizer the better. The flower of the coleus is inconspicuous, and should be pinched out. Remember, you are cultivating entirely for *leaf.*

Now suppose you plant a geranium in the bed prepared for the canna or coleus, you would have the same result—a *huge leaf*, bigger, perhaps, than a common tea saucer, but *no* flower! When you find that your geranium has a large leaf and scarcely any flower, you will know what's the trouble—soil *too rich.*

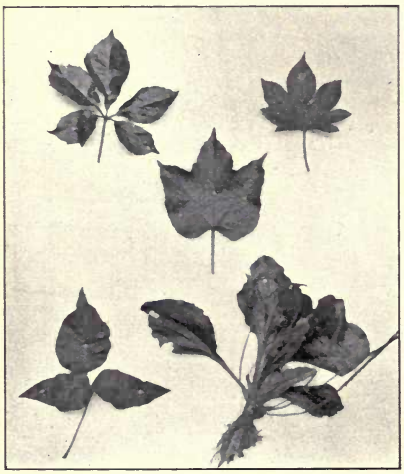

Photo 152.

Photo 153.

For the heliotrope, salvia and such plants, the flower-bed should be two feet deep, and the soil light and moderately rich.

For tulips, hyacinths, the gladiolus and lilies, the bed should be two feet deep, *well-drained*, and the soil moderately light and rich.

In photo 149 you have what was intended for a *flower-bed*, but no pains were taken to prepare the soil. In photo 150, the gravel was all dug out and sods dumped into the bottom, and good soil placed on top. Which is your choice?

Photo 154.

The quality of your plants and their bloom will depend on the *preparation* of the bed. Dame Nature has no favorites. Her laws are *unalterable*. She co-operates, and that is all. Then, if you want flowers, garden or field crops, be "up in the morning" and do your part.

VINES.

In photo 143 you have a view of a robust, rapid-growing vine; it is one of the gourds, the one known as "Hercules Club." The seed was planted on May 5th. (It is a *hard-shelled* seed, should have been planted four weeks before.) This photo was taken July 16th; from this you can get some idea of the rapidity of its growth. Photo 145 is the leaf and flower. Photo 144 is the same vine on August 19th. In ninety days from time of planting, the vines crossed over the front steps, making a growth of more than thirty feet in that time. We do not get *variety* enough in vines. There is too much planting of the old woodbines,

Photo 155.

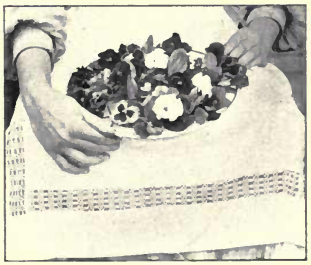

Photo 156.

Photo 157.

wistarias and such hardy plants for porch-shading. The hardy ones are grand, but it is preferable to have them *away* from the woodwork of a building. If you substitute the annuals, they can be removed after the first frost, and an abundance of light and air can be admitted to the building. Photo 146 shows the south side of the same building. You will notice the absence of all "stiffness" in the vines. The one that the lady is examining is the "variegated hop," a very attractive plant and a rampant grower. Against

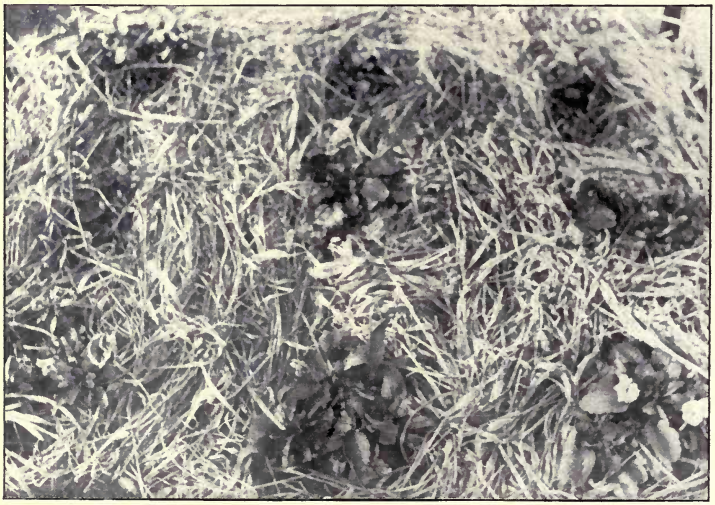

Photo 158.

Photo 159.

the house are growing the modest "puff-ball" and graceful cypress. This latter is not cultivated as extensively as it should be. Photo 147 shows you the delicate foliage and one each of its waxy-white and scarlet star-shaped flowers. Running vines on straight strings is too "studied." At the first window in photo 146 are a few morning-glories run up a stout string, and then allowed to ramble off and climb up a fish-pole that was standing there. They shade the kitchen window sufficiently, but do not shut out *all* the sun. In this way the *foliage* does not become dead *inside*. Photo 148 shows you the morning-glories taken *in the kitchen*, looking *out* of the window. Look up your seed catalogues and see if you cannot select something that will break up the "sameness" into which we have fallen in vine-planting. You are probably already admiring the *vigor* of these luxuriant climbers. How do you think these were produced? Now, don't be *shocked* when I tell you that it was "*night-soil*" that stimulated such growth. There is not a greater nuisance or abomination than the common *privy-vault*. Beyond doubt, it is a prolific pest-breeder. The *vault* should be abandoned, and a floor or drawer substituted. This should be cleaned regularly twice a week. Dry earth should be used each day. Contents should be kept covered

Photo 161.

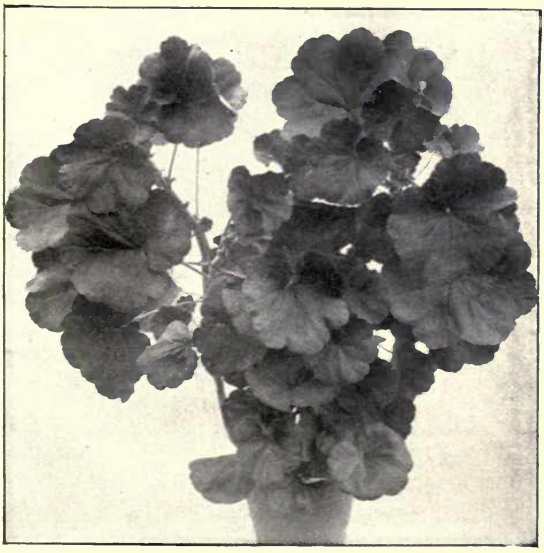

Photo 160.

Photo 162.

in a trench, and used yearly in making flower-beds and be placed under newly-set trees. Thus one of the most offensive nuisances is converted into profit and grandeur. The fine vines that you have admired in these photos are growing in borders dug out, two feet wide and two and one-half feet deep. The night-soil and earth were mixed in the bottom, making a compost about eighteen inches deep. Good soil was used on top. Having such a depth of earth, there was scarcely any water applied until real hot weather, and then but *comparatively* little.

To get vines, caladiums, cannas and all rampant, vigorous-growing plants to do well, throw out all the soil in the bed or border, and mix in a new supply of compost every year.

HARDY VINES.

It is preferable to train the hardy vines on trellises, brick buildings, old trees, etc., and not to have them on wooden structures. In photo 151 you see a beautiful arbor. This is the Virginia Creeper or common American Ivy, sometimes called "woodbine." This bower was made in 1881. Though over twenty years old, it seems to increase in beauty every year. The leaf of that vine you will readily recognize in the upper left-hand corner of photo 152. The leaf in the upper right-hand corner is the variegated hop. The creamy yellow stripes of the leaf do not appear here, as *yellow* takes dark in a photograph. The leaf in the center of that photo is the *ampelopsis veitchii*, or common "Boston Ivy," the very best plant ever grown for brick or stonework. See how it covers the brick, as shown on the corner of the house, in photo 153. In the lower left-hand corner of photo 152 is that dangerous little fellow, the *poison ivy*. The poison of this plant will not affect some people, while others will be affected by its poison carried on the wind. The antidote for this poison is a tea or wash made from the common "plantain," which you will see in the same photograph.

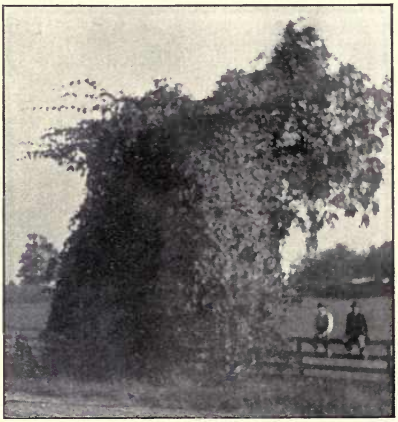

Photo 163.

THE PANSY.

Ah, modest, human-faced, wonderful, far-renowned pansy! Where is the child, the hurried woman, the busy man or the venerable patriarch that does not admire thee? How all desire to have a good pansy-bed, and how very few succeed! Yet the pansy is one of the easiest and simplest plants to grow. The gorgeous pansies of to-day are evoluted from the wee little "birdseyes" or "johnny-jump-ups" that grow wild in the open fields in Europe. It is claimed that a young German lady commenced their improvement. See where we are to-day, and *still* improving! What a lesson on *possibilities!*

In order to succeed with *any* plant, you must know the *nature* of that plant. You should always ask, "Where is the *home* of this plant?" When you know the *climate* from whence it came, then you have the key to success. Suppose they try to cultivate the coleus *out-of-doors* in England; *failure* is the result, not *hot* enough. In place of the gorgeous coleus, the English gardener has been driven to substitute some of the high-bred geraniums. The celebrated "Mrs. Pollock" was a marvel in England as a decorative plant, but the same "Mrs. Pollock" geranium in the United States is a total failure; *too hot*. In England no bedding-plant is more attractive than the brilliant, dashy calceolaria, but the *hot sun* of America is too much for it, and we are deprived of the pleasure of this plant in our lawns. In England the charming tuberous-rooted begonias are grown (for commercial purposes) in the open field. In America they succeed well *only in partially shaded situations*. These are enough examples to impress on you the importance of studying the *nature* of each plant.

Now, what is the *nature* of the *pansy?* About the same as that of the common violet. When do the violets bloom? In spring. You might call a pansy a *perpetual-blooming violet*. It is a *late fall* and *early spring* plant. Who is there that does not know that, under favorable conditions, one might go out and pick pansy blossoms *under* the snow? Knowing the *nature* of your plant, you have the key to success. Seed should be sown (in the United States) some time in August. Young

Photo 164.

Photo 165.

plants should be set the last week in September or early part of October, in a bed that has been prepared for their permanent location. Plants should be set about eight or nine inches apart, as shown in photo 157. Just before hard freezing, they should be put into winter quarters, as shown in photo 158. This consists in putting straw neatly between the rows and drawing it up close to the plants and tucking it in so as to prevent the frequent *freezing* and *thawing;* otherwise, the changes will lift the plant out of the ground and kill it. A few

leaves will do the same service if held in place by a little brush. Be careful not to cover too thick, or you will *smother* the plants. When hard freezing is over in spring, remove the leaves or straw and cultivate the soil. Never let a weed grow among them.

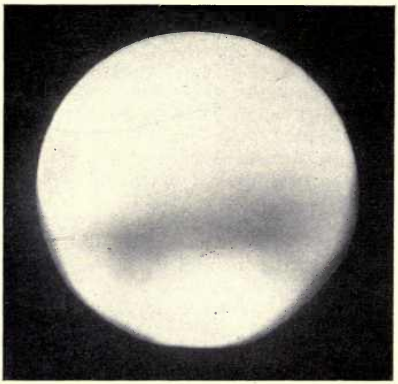

Photo 166.

But very few people know the *possibilities* of the pansy. It has a *wonderful root!* Had it not, it could not accomplish what it does. In photo 154 you have a specimen of an average young plant. It has just *one* flower and *one* bud, but the clump of earth that you see is all full of roots. You should make the bed for the pansy not less than eighteen inches deep. The first six inches in the bottom may be sod; the upper portion should be one-third *thoroughly* rotted manure, mixed with light soil. If the soil is not naturally light, make it so by mixing muck or leaf-mould and some sand. Photo 155 gives you a view of a pansy in a state of *rest.* You will observe the long, half-dead branches lying on the ground. One of them has been staked up for inspection. If you look closely, you will see quite a number of "joints." At each joint there has been a flower. There are twenty-one of them on this branch, and there were twenty-seven branches. It would average twenty flowers to the branch: $27 \times 20 = 540$ flowers on one plant, and this only *one crop!* At the crown of the plant you will notice a new supply of young wood coming up. This photo (155) was one of a bed of one hundred plants. At the same rate that this produced its first crop, the whole product would be between fifty and sixty thousand flowers! But they had done only about half their work. The new growth of wood that your attention was called to commenced its work in September, and is (at this writing) lying dormant under the snow. They will do greater work when spring opens, as they are already established on very *strong* roots. About half the weak branches should be removed; that will strengthen the remaining ones and give proportionately *large* flowers. These plants will have finished their work by the middle of July, when they should be dug out and the bed *renewed* with additional compost, and something else planted therein.

Photo 167.

Photo 156 presents to you a platter of November pansies, among which the *while* ones are very conspicuous.

Don't try to *force* your pansies in July and August; this is their season of *rest.*

To secure large flowers, the pansies should be cut every morning, leaving on the vines the ones that developed the previous day. It is well, occasion-

ally, to cut some of the weak branches with the flowers. Don't try to maintain a stock of pansies from the same plants, after the first seeding. They have a strong tendency to "breed back." In a few years they run into the commonest kinds. It will pay you better to get the new, up-to-date, improved strains. They are kept up under the highest state of cultivation and the most careful selection. Henderson, Dreer, Vick, Storrs & Harrisson, Burpee and many other firms send out a high-grade class of seeds. If you desire pansy *plants*, we would suggest that you write "The Columbian Pansy Farm, Kent, Ohio." They expect to have from three to five million plants next September.

Don't set young plants too deep; they would be apt to rot off. Don't put a pansy-bed in the front lawn, unless you are going to remove them in July and fill in with coleus or something else for summer display. Don't plant the pansy in shade or "partial shade," as recommended by many seed catalogues. You cannot get strong, healthy plants, nor the rich shadings of flowers, without *sunlight*. The error of the "*partial shade*" *recommendation* arises from the attempt to get the plant to work in July and August. The almost total failure of hundreds of thousands of people with the pansy ought to be enough to lead them to study the *nature* of the plant and adapt themselves to its requirements. Let us hope that all will profit by the *mistakes* of the past.

POT PLANTS.

There is no greater failure to be found than with "potted plants." This is *all* to be traced to *root failure*. To understand how that is brought about, read from page 40 to 56. It is utterly impossible for you to grow a healthy plant unless the roots are kept in what the florists call a "*working condition*."

In photo 159 you have a sickly geranium. It was grown in a 2½ inch pot; it is eleven months old. You have seen dozens, possibly hundreds in similar condition. Photo 160 presents to you a geranium nine weeks old. Compare the two. Well, you are anxious to know the *how* and the *why* concerning such a marked contrast. It is easily explained. When you put any plant into a flower-pot, and it begins to grow, the roots strike *out* toward the sides, i. e., they go toward the heat by which the vessel is surrounded. As soon as they reach the side they double back and are thrown up, down or sideways. As long as there is moisture and the proper temperature all goes fairly well. But I will suppose that the lady, after having attended the plants, turns her attention to other duties, or, possibly, goes calling. The plants, we will presume, are in the window, or, possibly, out on the flower-stand. The sun comes out real hot and strikes directly on this particular flower-pot. What is the result? Just this: the flower-pot becomes heated up so intensely that you could not bear your hand on it, and every one of those delicate little fibrous rootlets are destroyed! What follows? Just this: one, two, three or more of the lower leaves droop, turn yellow and drop off. Why? Because all the *pumps* that had sent up the moisture are ruined! You come along and exclaim: "Why, dear me! The plants are wilted." You hustle around and sprinkle them and thus save them from total destruction. Do you know what such a shock to a plant signifies? It means this: that *you* must wait, perhaps, from three to five weeks before the plant can reconstruct the root force that you have allowed to be destroyed in probably not more than fifteen minutes exposure. Repeat this two or three times and the season has gone and you have had no good from your plant, and you tell Mrs. Jones and Mrs. Smith that you "never have any *luck* with plants." Madam, you must discard *all* such ideas as *luck* if you wish to succeed as a plant-grower. There is no *luck* that enters into it. The *luck* that produced the healthy, vigorous young geranium in photo 160, consisted in putting the flower-pot into a jardiniere, and thereby warding off the hot rays of the sun, and preserved the roots *cool* and *moist*, about the same as they would be in the open ground.

You can ruin any pot plant by exposing it to the rays of the hot sun, or even a *surrounding* hot, dry air, such as you find in an ordinary dwelling room, or by a *low temperature*, which would *chill* and destroy the feeders. Geraniums, fuchsias, heliotropes,

begonias, carnations and roses fail almost entirely, when potted, from this source. Photo 161 gives you a view of a rubber plant, grown in about sixteen weeks, by Mrs. F. H. Clark, of Cleveland, O. It has been kept in the jardiniere which you see by the side of the plant. The millions of plants that have been destroyed from this source certainly ought to be enough to lead amateurs to *pause*, *think*, and adapt themselves to *conditions* that will result in success. The *small* hanging basket is a failure from the same cause as the aforementioned pot plants. Plants in *small* vases amount to nothing for the same reason. You can procure the finest results by sawing a common barrel in two and nailing sticks on outside for ornamentation, and using this for a lawn vase. Two or three bushels of soil can be put into such a receptacle, and vines, coleus, geraniums, feverfews, lantanas and such like will make the rankest kind of growth in them. Therefore, if you are going to have a hanging basket or vase, be sure you get *large* ones; for, having such an abundance of earth, they retain the moisture and make a luxuriant growth.

The jardinieres of to-day are very handsome and, though they seem high-priced, by all means procure them, even if you do with less plants. Small boxes or anything else in which to plunge the flower-pot will answer the same purpose as the handsomer jardiniere. A neat window box, eight inches deep and one foot wide, with plants set in it and spaces filled in with moss, will answer all the purposes of the jardiniere.

If you purchase a plant in a small pot, turn it upside down, tap the edge on something hard, and the ball of earth will come out of the pot. Examine rootlets; if they appear brown and dried, it indicates that it is getting pot-bound and should have been shifted into a larger crock before. Shift at once into a four- or five-inch pot, in six or eight weeks into a six-inch. Common pot plants should be shifted at least three times in the growing season. The florists' rule is: "*Never let a plant get pot-bound*, but maintain 'working roots,'" i. e., those that have a whitish look. When the roots begin to turn brown, it indicates that they are being subjected to conditions that are unfavorable; that they have either been affected by too high or too low temperature, or that they need *more room*.

The *one* lesson that the United States must learn is to take care of the *roots* of their trees, shrubs and plants. All the troubles that are classed as "blight" in trees, dried-up farm crops and withered flowering plants are to be traced to root failure. This is one of the points that we have endeavored so much to impress on the reader of this work. People must learn it and apply the remedy or *continue* to fail. Nature will not turn aside to make amends for anyone's lack of knowledge or neglect. Remember, then, the *two* points of danger, namely: You can weaken the plant with *too much* water or *not enough*. In pot culture, you guard against too much by providing a good drainage. This you can do by placing a few bits of stone, broken crock or rough gravel in the bottom of the flower-pot and, as just stated, you prevent the *burning* of the roots by shading the crock in the box or jardiniere. There is no established rule for watering potted plants further than this, namely; if it be in the winter months and the plant is nearly dormant, it may not need watering once a week; if it be the summer months and the plant is growing rapidly, it may require watering twice a day or more. Never let the earth get *soggy* or *parched;* keep nicely moistened. Your success with pot plants will be measured not so much by what you *know* about them as by *how much you watch them*, and thereby *prevent* root injury.

Worms and other insects that injure roots of potted plants can be destroyed by tobacco water. Tobacco stems can be procured from cigarmakers, or cigars, smoking or chewing tobacco might be soaked to a consistency of strong tea. Tobacco water is not only destructive to vermin, but is a good fertilizer. Syringe the plants with tobacco water to kill lice, green fly and such pests. If you cannot dislodge the green fly by spraying, put plant into a dry goods box and cover with carpet or some other material. Put in a tin pan with ashes in the bottom and live coals on top, on which you place tobacco stems. Don't overdose at first, for the heliotrope and some other plants are easily injured by tobacco smoke. Remember, it is much easier to *keep* the vermin off

the plant than it is to *drive* them off. Keep the plant healthy by caring for the roots and a comparatively little syringing with tobacco water would make the foliage of such a plant an undesirable habitation for Mr. and Mrs. Bug. To remove scales from the ivy, orange tree or any other plant, make a wash of whale-oil soap and add a very little carbolic acid. A small, flat paint brush is a convenient implement to apply it with. If scales stick too tight, get a splinter of wood and gently scrape the branch, but do not break through the bark. Syringe with water in about two hours after applying wash.

Good soil for pot plants is very essential. Those living in cities and having no gardens would better get it from the florist. Those having a garden should keep a pile on hand. Never waste the *leaves* of trees. Make a heap and rot them down. Leaf mould, with common soil, makes the *best* of potting soil. Have a pile of rotted sod on hand. To make a soil that will do for all pot plants, mix one-half rotten sod or good garden soil with one-fourth well rotted manure and one-fourth decayed leaves. This will never "bake." These are the main points that will lead to success in pot-plant culture; the little variations and details you will learn by observation and application.

THE GRAPE-VINE.

So much has been written concerning the *grape* that it seems everyone would know how to cultivate it. Instead of this, it is *blunder* and *fail* in the majority of cases of attempts to grow it. Some years ago, an acquaintance of mine requested me to fix up his three vines so that they would *bear*. Examination revealed the fact that they had been "*butchered*" five years in succession. Some fellow, in order to make a dollar, had posed as a "professor" of vineyards. He had followed the stupid custom of cutting *all* the branches back to "*two eyes*." The vines were run on a trellis, some thirty feet in length, and were very strong. This grape-destroyer had actually cut off and thrown away about ninety-nine-hundredths of the fruit-buds! The roots, being very vigorous, had *forced* the remaining fruit-buds into *strong wood* to repair the damage of the *destroyer*. This had been continued for five years, resulting in *no fruit*. We took the vines from the trellis, spread them out, cut away all dead wood and weak branches and preserved the robust canes over twenty feet in length, which were retied to the trellis, spread out so that the light and air could play around them. The result was, six bushels of grapes! Grape-vines, by the hundreds of thousands, have been practically destroyed by this "two-eye" folly. The error originated some thirty or more years ago by a suggested plan to throw all the force of the vine into *one* branch and then run this on a wire, *form fruit-spurs at every bud*, and then keep the new wood *at those joints* cut back to *two eyes*. That system works all right if people know how to do it. This found its way into the newspapers and a rage commenced. "*Two eyes*," "*two eyes*," in every newspaper. If nature had not asserted her power and persisted in living in spite of the vine-*butcher*, there would not have been a grape-vine left with *one eye*.

As all who grow grapes for the market are supposed to have informed themselves on the various systems of cultivating and training the grape, a few suggestions to the amateur is all that is needed.

In pruning, cut out all old wood and strip off old bark. Cut out all weak branches and preserve only the vigorous ones, and tie these up where they will be spread out to light and air.

In England the grape is grown almost entirely under glass (in "graperies"). Some twenty years ago I became acquainted with an Englishman who had just come over the "pond." He was a fairly well-trained gardener and hired out to a gentleman of considerable means. He followed the English method of *summer pruning* of a grape fastened against a brick wall on the south side of a building. He cut away the leaves severely to admit light and air, and he succeeded! He let in enough sun to heat the bricks scalding hot! The intense heat was reflected on the under part of the leaf and scalded the epidermis. The outer edges of the leaves commenced to curl back and shrivel. In a few weeks the wail went up, "The grapes are blasted and covered with

mildew." In the name of George Washington, what else could happen to them? Mr. and Mrs. Mildew were abroad on atmospheric wings, hunting up territory where to raise a prolific family.

Just after a rain-storm they came along and, in their way, said, "Thanks, Mr. Englishman, for preparing this soil; here is where we'll locate." In a few weeks their name was "Billions!" We were called upon for advice, which was given, and was substantially this: My friend, in England it was a necessity, where there is not enough sun for the grape, to cut away a part of the foliage to admit light and air, but here, *on the south side of a brick building*, where there is a torrid heat, you must perform no summer pruning. You must leave on *all* the foliage to *shade* the fruit and prevent the sun from heating the bricks and reflecting such heat on leaf and fruit, thereby destroying the epidermis. The suggestions were followed, resulting, the following year, in perfect fruit. When the calamity happened to the vines just mentioned, the effect on the foliage was substantially the same as that on the leaves of the pear trees alluded to on page 48. In both cases the *power* of the leaf to perform its functions was destroyed, one from a temperature of about 20 degrees, the other above 120 degrees as it reflected from the scalding bricks. In such occurrences the feeding rootlets are affected and, in a few days, perish. The spores, then, lodge on this dead tissue, and the various diseases begin to multiply. After such a shock no plant can reestablish itself the same season.

Volumes have been written concerning "black rot" and kindred diseases of the grape, but the facts are, *all* those maladies have their origin from the same source, i. e., *the destruction of the root*. Remember that the root may perish in consequence of the *leaf* having *first* been destroyed, or the root may drown, die of thirst, or otherwise lose its life, and thereby destroy the leaf. It matters not which is attacked *first*, both have to suffer. The injured leaf is appropriate soil for the fungi and the feeding-ground for bugs. In the case of the vine on the south side of the brick building, it was destructive to the crop to apply summer pruning; but suppose a vine stands in some shady place and has heavy foliage; in this case a part of the young vines and large leaves must be removed, or they commence decaying *for the want of air*, and mildew at once sets in on them. The viticulturist realizes that he must preserve a healthy foliage; this cannot be done without a sound root.

Here comes in the unfortunate part of the whole affair. Those who were engaged in the introduction of grapes, forty or fifty years ago, took the greatest pains to *prepare* the *soil* and to have it *deep* and *well-drained* and kept clear of weeds. Since that time the spirit of money-making has inaugurated a pell-mell rush in producing *numbers* of vines, and now we purchase vines that have been weakened through neglect or thoughtlessness and often grown amid rank and destructive weeds. The great desire among nurserymen has been to find a grape that is *mildew-proof*. I speak reverently and thoughtfully when I say that the *Almighty* himself could not produce such a specimen without changing the *laws He has established*. The normal condition of everything is *health*, and it is a crime to be sick. The mildew, black rot, bird's-eye rot, etc., with which we are afflicted, is the penalty we are paying for the *neglect of the roots, bad drainage, shallow and poor soil and plants that have been weakened by overwork*. As we improve the *quality* of a plant we reduce the hardiness of it. This is illustrated with the coleus. The more richly-colored the leaf, the weaker the constitution of the plant. This is generally true with cereals and fruits; hence, just in proportion as we have made improvements in fruit, in that same ratio we should have kept up a *high state of cultivation*. But, alas! things have gone in just the opposite direction! The most inexcusable thoughtlessness and neglect have characterized our whole conduct in planting and cultivation, or rather *non-cultivation* of vines and trees and, thereby, as before stated, we have created the most prolific hot-beds of the diseases with which we now have to battle.

How many grape-vines did you ever see that were pestered with the "rot" or mildew when they were allowed to run wild? Not many; for in a wild state their plant sense

leads them to adjust themselves so that each branch may receive the necessary amount of light and air; an example of this is given in photo 163. If you have a grape-vine that does not do well and it stands near a tree for which you care but little, let the vine take possession of the tree and you will have a great abundance of unblemished grapes, although the bunches may not be quite as *large* as some grown for exhibition purposes. The grape must have perfect drainage, and the soil should be prepared not less than three feet deep, with bones, lime and ashes worked in the bottom.

The whole country is smarting under the punishment of our neglect and oversights. There are two things that we must do to gain the ascendency over our insect and fungous foes. We have been keeping both eyes on the *top* of the tree. We must now keep only one (the left one) on the branch and the other on the root. Our scientists are, as a rule, not only men of knowledge but of *good sense*, and I sincerely hope that our agricultural experiment stations will use their utmost powers to educate the people to provide better *root conditions* for all plant life; in this way the plant will regain power to *help itself* while we are attending to part second, namely:

KEEP ON SPRAYING.

Almost everyone interested in a tree or vine has informed himself on spraying pumps and insecticides. With nursery stock diseased and plants, from which we obtain our seeds, vitiated from poor soil and attacks of insects, it becomes a very grave question as to *how many real healthy plants* we have to start in with. Therefore, it is the duty of every citizen who has a tree or plant, to act as a volunteer in making war on these insect pests. He should equip himself with a "spraying machine," if it be nothing but a hand one. If a general raid were made on these foes with insecticides, holding them in check, while we pull out and burn up half of the fruit trees and vines now in existence, and commence planting *nothing* but healthy stock, being careful the soil is prepared right and keep the ground well cultivated and perfectly free from weeds, inside of fifteen years there would be an entirely *new era* in fruit-growing. This is no *dream* — it is a grand possibility that lies before the American people. The *wise* man can certainly see this as plain as the noon-day sun, and the *wiser* and *wisest* of men will begin to hitch their teams to the old, pest-breeding trees and vines, pull them out and burn them up, prepare new fields for orchards and vineyards, take time to prepare the soil rightly, see that the under draining is perfect, hunt up a nursery that will give a guarantee of perfectly healthy plants, form the tops in the right place, look after the pruning every season, see that trees are properly guarded, fertilize annually, etc., etc.—such a man will go into the market with large, tempting, luscious fruits; and, last but not least, *come home with a pocket full of money*.

There is a great lamentation throughout the land over the deterioration of our fruits, but hitherto the people have not discovered the real sources. In the *wounding* of apple and other fruit trees we have poisoned the sap with the dead tissue that passes into the circulation and created harbors for insects and weakened the constitution of the plant by this grave error. Then, having failed to underdrain and prepare the depth of soil that should be for our trees and vines and, having failed, also, to cultivate and keep clear of weeds, we have allowed these faithful friends of ours to wilt in the hot sun and thereby destroy the leaf on which, in turn, the fungi take root and on which insects in untold billions feed and thrive, *we* having created the *conditions* on which they exist.

Inspection of Nurseries.

In asserting that our scientists have fallen into error, the author of this work has no intention of casting reflections upon gentlemen of such excellent ability as those who have rendered so valuable service to our country by their tireless investigation and research; far from it. But the facts are herein set forth that pear blight, leaf blight, or any other blight comes from the destruction of the *feeding roots.*

In bulletin 72, page 199, issued by the agricultural experiment station, Wooster, Ohio, in August, 1896, there is a photograph of peach trees affected by the "yellows," but they are growing in a raspberry patch! Now, what can you expect from a peach tree with such environments? How in the name of good sense could a tree stand a chance to procure moisture when raspberries (and probably grass and weeds) were pumping it from the soil? Among the sure signs of yellows are the well-known facts that the winter buds and adventitious buds often become excited into growth in August or the fall months. To some this seems mysterious; there is no mystery about it. Remember, if you have cut off the moisture from the roots the leaves must suffer. When the leaves drop, the *tremendous effort* of nature is then asserted to maintain *life itself.* Life cannot be continued long without foliage. The tree, then, calls on all its "reserves" to carry it through the ordeal. The latent buds then spring to the rescue, form new lungs for the tree, manufacture the cambium, etc. The mischief that has been done, however, cannot be undone. Sooner or later the tree will perish. We have elsewhere set forth the fact that the main battle is won over disease *in the preparation of the soil.* Before an orchard is planted, *two* years should be taken in making the soil ready. A plenty of manure, lime, ashes and *sub-soiling* are essential. Individuals setting a few trees can prepare in short order by digging holes (see pages 41 and 54). This *one fact* must be kept constantly before the mind, namely: it matters not what *kind* of manure you apply to a plant, it derives *no* benefit from it, only as it is in a state of solution; in plain terms, only when the food is *soaked out* and *mixed with water.* Those wonderful, microscopic workers that we have been pleading for so hard, absorb or literally *drink up* all plant food in a *liquid* form, just like those marvelous little glands or ducts in the stomach and intestines of the animal or human being, which *absorb all nutriment in a juicy or liquid state.* If the tree is planted in poor soil, and has *nothing but water*, it necessarily will be frail.

Now, suppose you plant a small, young, healthy tree in the proper soil and, instead of planting raspberries, or allowing grass and weeds to grow, every fall you apply a good top dressing of manure and, in the spring, work in a little lime and ashes, and cultivate to keep down weeds; the result of such a course would be the maintenance of *perfect health*, and I repeat the assertion, *health defies disease.* I do not pretend to know what "peach-yellows" is and no one else seems to know. It is not necessary to know what smallpox is; but this we do know, that a *perfectly healthy person* will not take it. Medical authorities tell us that a healthy stomach will digest the germs of any disease, actually convert them into *food!* One man spends a lot of money in trying to *exterminate rats;* another uses a little *forethought* and constructs his barn so that rats and mice cannot get into it; every child knows which is the wiser man.

The fact that peach-yellows has been proven to be contagious by *budding* deceased wood into healthy trees does not disprove what I assert, i. e.: *a healthy plant defies disease.* You may inoculate a person with the virus of any malignant disease and, perhaps, produce death. But you have not proven that such a person had not the vital force to repel such a disease had it not been *forced into his system.*

Life, everywhere, is *a great battle* and the victories are won by first attacking the *weak points.* When once an entrance is gained, then the "strongholds" may be reduced. We know of such a thing as "body lice," but such disgusting creatures do not exist on healthy bodies, but are found on those that are impoverished and covered with effete

matter and other filth. The spores of fungi float in the air, and just as soon as the state of a leaf is in a favorable condition they take root and begin to multiply.

The gentlemen at the head of our numerous experimental stations, together with other scientists, in twenty years have done more investigating and brought to light more facts concerning fungous diseases, scaled insects, bugs, etc. (and also given the remedies), than the other nations have done in the whole history of the world. This is characteristic of America. Whether it be in base ball, horse race, commercial activity or even *war*, Uncle Sam "gets there!" But, hold on, uncle, just one minute. It won't hurt you to take time enough to wipe the sweat from your brow, expand your chest and fill your lungs with *h*oxygen! Permit me to tell you, uncle, that amid your hurry-scurry, money-making, microscopic-disease-hunting, remedy-finding labors, you have overlooked one important fact, namely, that while you have labored conscientiously and faithfully in examining *leaves* and *branches*, drawing and printing the shapes of formidable bugs and pests of every description, *you*, at the same time, have been preparing the *conditions* on which these dreaded diseases thrive, by *neglecting the ROOTS* of the plant. The time has come when America, in order to defeat the innumerable billions of insect pests, must *pause long enough* to learn from British, French and German horticulturists and orchardists that the *first* and *all-important* step to success in tree culture (in fact, in the cultivation of all crops) lies in *the preparation of the soil and good drainage.*

But, alas! alas! the diseases are among us! Whence came they? Have they sprung up from our individual neglect, or were they introduced from the nurseries in a diseased condition? Perhaps from both sources. Our experimental stations have traced diseased plants to the nurseries from which they came and have experimented on diseased trees *in* the nurseries. One thing we do know, i. e., that many nursery firms not only advocate deep plowing, sub-soiling, etc., but *practice* it. But other questions arise, such as, have they *overworked* their soil, failed to fertilize, etc., and, thereby, weakened their stock? Are their buds and scions *always* taken from perfectly healthy trees? I have not had the opportunity to make personal examination, consequently cannot be charged with intimating aught against any *particular firm.* But this I say with positiveness, that *every nursery in the United States should be kept under governmental inspection* as watchfully as the products of packing houses or other articles are kept under the vigilance of the pure food commission. The fact that *leaf blight* (spotted leaves) have been detected in nurseries would indicate light, sandy or *poor* soil. (See "Blight"). No nursery should be permitted to send out stock unless it be under a guarantee of being true to name, and *absolutely sound* in health. Nursery firms that have healthy stock will say "Amen" to this proposition. If any be found that have stock vitiated by inoculation from "yellows" or any other constitutional disease, or infested with the San Jose scale, mealy bug or any other contagious pest, they should not grumble if they are ordered by the government to dig up such pest-breeders and consign them to the flames. *Government* is for the protection of the citizens and, if you want laws to thus protect your interests, *see that they are enacted.*

The United States is waking up to the fact that *fruit* acts both as a *food and medicine*, but fruits from unhealthy trees, while they are not *poison*, are far from being desirable. What we need is a great abundance of fruit, from healthy trees, so that it will be so cheap that *all*, the poor as well as rich, can have all that is needed. This would, in part, destroy the appetite for *strong drink.*

When your order of young trees comes from any nursery, before planting treat them with the following mixture, prescribed by the Ohio experiment station; we have found this to be one of the best to destroy bark-lice or any other lurking pests:

Dissolve one quart of soft soap or one-fourth pound of hard soap in two quarts of boiling water. Make a mixture by taking *seven* parts of this solution and *one* part of crude carbolic acid. Apply with a scrub-brush, but be careful not to break off the buds on the *leader.*

Talk With Boys and Girls.

YOUNG FRIENDS: Did you ever stop to think that twenty-five years from now America will be *just what you are?* To put the matter in a declarative form, you who will then be alive will be *America as the world will read it.* What will *you* be? If you do not know let me tell you: You will be *just what your thoughts have made you.* What books do you read? Every word you hear and every word you read is the picture of a *thought.* Your mind is a camera, your eye is a lense, your brain is a *sensitive plate* which receives the image of the object for which the word stands; hence, just whatever shall be the nature of your reading matter and the company you keep, these will determine the *thoughts* that are kept before your mind; and your outward, visible self will be only an expression of your *real self, your thoughts.* This is an age of *fiction*, and I know of nothing particularly wrong in a fictitious work when read for the purpose of relieving the mind from heavy, laborious tasks; but if you make fiction your *food*, you will become a *fictitious excuse* for a representative of manhood or womanhood. It has gotten so now that many young people (and some older ones) cannot read any facts unless they are woven in with a "love story."

Take a look at photo 164. See how these two young people are absorbed in reading a love affair! Nothing bad about it, but, mark you, they are not *practical;* they are not observing the *realities* by which they are surrounded and that are overhanging them! They don't seem to be conscious of the presence of that little rascal, the *small brother*, who is ready with his fishing-pole to start the *hornets* from the nest hanging nearly over them! How that vision of Utopian bliss will vanish and what a *scattering* there will be when that nest is disturbed! Don't hug your best girl and read love stories under a hornet's-nest.

In photo 165 you have a *practical* boy; it is Paul H. Davey, seven years old. He and his brother Ira have been taking care of one thousand young elm trees, started the first year of the new century. These trees are to be presented to the citizens of Cleveland (see pages 50 to 56, inclusive).

How many of you young people have made a study of plant life? Have you ever thought that *life, itself*, is the greatest miracle known? Yet some avow that there is no such thing as a miracle. Who can explain the life force of a blade of grass? No one. The life of the human, the life of the animal and the life of the tree are all governed by similar laws. We live at an epoch when there is a veritable *hobby*, bordering on a craze, about *reforming*. There is a lack of real, sound thought in our social and religious systems. A boy goes astray and plunges into the depths of vice. When he gets so far that he detests himself and is loathsome to decent people, occasionally one will *reform*, make a hero of himself by telling what a demon he has been, and good people lionize him; indeed, sometimes, almost make a demigod of him. We should encourage anyone to do better, but to make heroes of those who have been cursing the world with their vices is not salutary. The *formation* of character is what we should encourage, and in that every boy and girl should strive to be perfect. In photos 32 and 33 you have trees that have been rightly formed, while photo 87 shows you a specimen that is *deformed* and, in 96, is a tree that has been started on a process of *reforming*. It is better to reform than to go on to destruction; but how deplorable even to think of the result of bad influences that grow out of evil that has been committed! And think of a character tarnished with vice and wounded with crime! Young people, think of this: *a wrong that is done never can be undone.* What a distressing and deplorable sight are the wounds on the trees on the first dozen pages of this work! How infinitely more hideous will be the wounds on your moral character if you allow them to be placed there. How inexcusable the folly of wasting a life in vice when there is no end to the good that might charm our lives and fill us with joy unspeakable!

Nothing fills one with greater delight nor is more elevating than the study of nature.

He who studies a leaf or a flower is brought into communion with the Creator. It is hoped that all young people will catch the spirit of this work and help to procure trees, plants and flowers that will be perfect in health and symmetrical in form, and fruits and flowers that shall cheer and bless our homes; but don't forget to *form* your own character. Next to the study of nature on this planet comes that of astronomy, which, perhaps, is the most thrilling and awe-inspiring of any science taught. Truly, "The heavens declare the glory of God and the firmament showeth forth His handiwork; day unto day uttereth speech, and night unto night showeth knowledge."

However people can drift into a habit of reading silly trash is a mystery I never could comprehend. Learn all we can concerning *life* on this globe and what we can from the firmament above, and we have only gathered a few pebbles from the beach of an infinite ocean of facts! Young people, in the name of America, the heaven-blessed land you so much love, I pray you read no literature and form no companionships that will lead to a wasted life and a *deformed* character.

One evening, last October, we took a notion to photograph the moon. We give you the result in photo 167. It was a strange freak of the camera. The exposure was about ninety seconds. How to account for two full moons, a half moon and a double eclipse is too *hard* for the author of this work to explain. Photo 166 is the camera's record of the *rising sun*. Oh! that glorious, life-giving, immutable orb! Almost infinite is his power! You see the floating particle of mist, the tiny, dancing snow flakes; they fall, they melt, they unite with others. "Little rills make wider streamlets, streamlets swell the river's flow, *onward, onward, as they go*," and by the accumulation of the waters of many rivers, the majestic Mississippi and the mighty Amazon are formed. Did you ever think of the millions of tons of water that are daily poured into the oceans from our great rivers? Probably you have; but have you thought of how this inconceivable quantity of water was *first* lifted by the sun in the form of invisible particles of moisture, diffused through the atmosphere, condensed as dew or rain-drops, taken up by the roots of trees and plants of every kind and carried to the *leaf*, that marvelous laboratory of nature, where the vitalizing oxygen is manufactured, without which no animal or human being can live? If you have, you certainly must realize something of the importance of producing and maintaining a *healthy leaf*. One of the objects of this work has been to show that there cannot be a *sound leaf* without a *healthy root*.

God bless the noble souls who introduced *Arbor Day*. May every child learn the mission of the *tree* and *plant*. To the rising generation we must look for better trees, perfect fruits and sweeter and more gorgeous flowers.

In house-building do not make the mistake of constructing an air-tight house, and shutting out the vivifying, electric rays of "Old Sol," your best friend, and then "dope" yourself with "quack" medicine and ruin your stomach. Rise with the lark, study vocal music from the songster, see him bask in morning sun-rays and behold, when he sings, how every fibre of his being *thrills* with ecstatic joy!

The study of nature is purifying to the soul, and he who becomes acquainted with creation *sees the hand of the Creator;* hence, the Nazarene uttered a grand, philosophical truth when He said, "Blessed are the *pure in heart, for they shall see God.*"

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RAIN MACHINES.

Very few people have a correct idea of furnishing the proper quantity of water for crops.

By May 1st we expect to have the photographs ready of the *rain machines*, which will supply the right amount of water wherever used. Every boy and girl should learn to operate them. With the photographs of these machines goes the instructions for their use.

With these will be given the photograph of the *home* of good old *John Brown*, whose "*soul goes marching on.*" Also, the photograph of the historic "Brady's Leap," and the place where the brave Indian fighter hid under the trunk of a fallen tree (in what has now become the celebrated "Brady's lake") while the red-skins stood on the trunk of the same tree and discussed as to his whereabouts. This will be prepared especially for young people and will be put up in neat booklet form. Price, 10 cents.

In this booklet, also, will be published the best-known formulas to be used in spraying trees, washes to destroy bugs, scales or bark-lice, etc. Also, you will be instructed how to prevent potatoes from "running out." The book will be called "Davey's Rain-Maker." It will be sent by mail, postage paid.

ADDRESS:

JOHN DAVEY,

KENT, OHIO.

"THE TREE DOCTOR"

Has been kept within the limits of *ONE DOLLAR*, so that those of moderate means may be able to procure it. All the practical points on tree-planting, tree-surgery, landscaping and floriculture, by the aid of the camera, are given in less than one hundred pages, and "peach-yellows," "pear-blight" and all those maladies commonly called "blight" are traced to their source.

You probably have a friend who would be benefited by this work. You might bless him by sending him a copy.

Always purchase of the agent if he is around. If not, send *one dollar* to JOHN DAVEY, KENT, OHIO, and the "*Tree Doctor*" will be mailed to you, postage paid.

THE AUTHOR.

A SERIOUS STATE OF THINGS

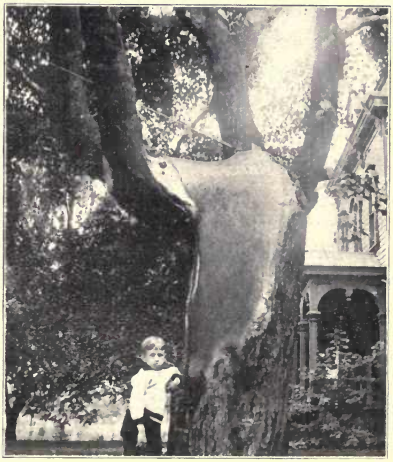
The result of the publication of "The Tree Doctor" has been; its author has been called into various states to make an examination of trees. This has developed the serious facts that not more than 10 per cent of our trees are sound! Their diseased condition comes either from neglect or brutal treatment. Trees are dying before they have attained to a third of their natural age. Out of this condition has grown up the industry of **"TREE SURGERY."** Intelligent young men have been drilled in this work. The way that trees revive and respond to kind treatment is a marvel to those who are not acquainted with the wonderful forces of tree life.

Here is a case of genuine "Rock Maple." The huge wound came from neglect.

The first photograph shows the young "Tree Doctors" as they are tracing the rot up into the powerful arms and down the trunk, clear into the roots. The second shows the tree filled with portland cement. It took over four tons to fill the cavity. The treatment adds, probably, from one to two hundred years of the life of the tree.

Those desiring such work done should address

JOHN DAVEY,
KENT, - - OHIO.



A GREAT WORK

IN WHICH ALL SHOULD TAKE A PART

The Tree Doctor was first published with a view of correcting "Tree Troubles" in Cleveland, O. It has practically revolutionized tree culture in that city. It is the photographic work that makes it affectual. Since its appearance, the author of the work has been called in all directions to inspect trees, and now makes the alarming declaration that not more than ten per cent of trees are sound! To help arouse the country to the seriousness of the situation, he has invested in a stereoptican lantern, and, by the use of some 200 photographs, is enabled to let people "SEE" what is the trouble. Nothing in the lecture field has proved so educational. It should be presented as fast as possible all over this broad land. Those desiring the lecture, should communicate with John Davey, Kent, O., in order to arrange for dates, etc.

The following letter is a sample of the many favorable testimonials given.

SHARON, PA., FEB. 19th, 1904.

To Whom it may Concern:

At the request of the Civic Committee of the Sharon Board of Trade Mr. John Davey, author of "The Tree Doctor" gave a stereoptican lecture in the Presbyterian Church, Sharon, Pa. on the evening of January 21, 1904, showing in an excellent manner on canvas the destructive way in which our trees are being butchered and also the means for remending the trouble and thereby preserving their life and beauty. Mr. Davey's lecture was repeated the following evening for the special instruction of the school children.

We most heartily commend Mr. Davey in his laudable effort to awaken public sentiment for the better preservation of trees and shrubbery and believe that by a more general dissemination of the information given in his lecture and also contained in his book "The Tree Doctor" that public spirited citizens everywhere will be glad to see that their trees have better care in the future than they seem to have had in the past.

W. L. WALLIS, President.
W. B. HERRIOTT, Secretary.

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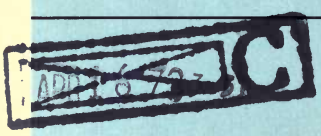

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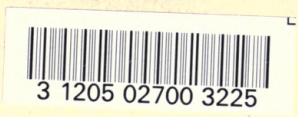
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